Forestry

VETERINARY MEDICINE

March 1934

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Small Animal Practice Issue III

Arranged by H. J. Milks

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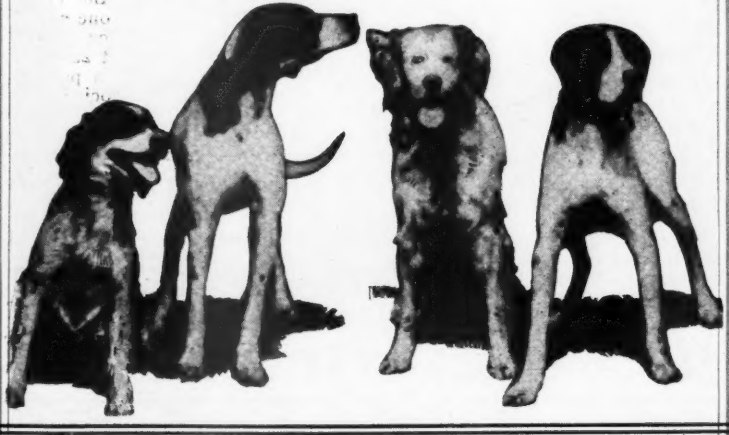

No. 3
VOL. XXIX

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MARCH 1934

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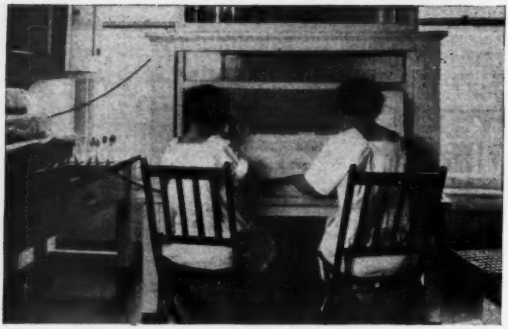

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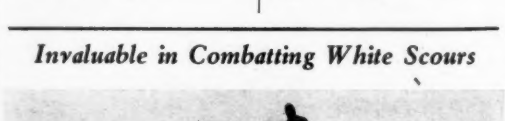

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Foreword

THIS is the third issue of VETERINARY MEDICINE devoted exclusively to the diseases of pet animals. The first issue, April, 1929, was an experiment. The reception was more than pleasing, and indicated that there was a real desire for such a number. In November, 1931, the second number appeared. Its reception was also good. Now the publisher believes it time for a third one.

Those unfamiliar with the subject of small animals have no idea of their value, nor of the money invested in them. According to figures given by Chas. J. McAnulty,[1] the dog industry is a seventy-five million dollar business. His estimates are as follows: Five million dogs for which license fees are collected in various parts of the country, with an average value of $10.00 per head—$50,000,000; one million dogs kept in show kennels, breeders' kennels, and traveling from one show or trial to another, which are not taxed—$20,000,000; about fourteen monthly, and two tri-weekly magazines, devoted exclusively to the dog; veterinary kennels, boarding kennels, professional handlers, and judges—$2,000,000; dog foods, supplies, benches, etc.—approximately $3,000,000.[2] Veterinary practice, however, is not confined to registered dogs; perhaps in every city and certainly in the average city unregistered dogs greatly out number those that are licensed. Some years ago the U. S. Department of Agriculture ascertained that 7,000,000 farm dogs were listed with the county assessors. Certainly a far greater number are unrecorded.

In the United States, small animal practice is but an infant, scarcely a generation old. There have been a few men, pioneers if you please, with the necessary vision or foresight, who specialized in this branch of veterinary service. They were often considered a little off mental balance, when they declined horse practice and specialized in the diseases of pet animals. In the early days of veterinary medicine, veterinarians, or as they were usually called, veterinary surgeons, were a horsey group. They did not want to treat any animal but the horse, in fact, knew little about other animals, and most of them

[1] McAnulty, Chas. J., Breeds of Dogs and Dog Shows. Twenty-Sixth Annual Conference for Veterinarians, New York State Veterinary College, Ithaca, January 11-12, 1934.

[2] This figure again illustrates how little is known definitely of the dog industry. J. W. Patton, who is undoubtedly better informed in regard to the dog food industry than any other veterinarian, places the annual sales of dog foods at the enormous figure of 150 million dollars. Undoubtedly the investment in ground, buildings, equipment, etc., is in excess of the annual sales.

had no wish to learn anything about them. They could not as a rule give very satisfactory services in small animal work in the cities, nor in cattle and small animal work in the country. They professed ignorance about everything except the horse. Their clients pretty largely took them at their own estimate, and did not bother them greatly.

With the so-called passing of the horse, conditions changed. The veterinarian in the city had to substitute something else for horse practice, and turned to small animals. This was uphill work in many instances because they had so thoroughly convinced their clients that they knew little about dogs and cats. Most of them, however, were able to hang on, and in time became familiar with the work. Those living in the smaller cities and rural districts turned from horses to cattle and swine. A few from the start and now much larger numbers are endeavoring to do all the small animal work possible. When their clients find that they are capable, or can give a dollar's worth of service for a dollar, more of this work will go to them.

No place is so small that there will be no work in this line if the veterinarian is able to do it, and often this kind of practice makes just the difference between good and poor business. People have pets because they love them, and will employ veterinarians to doctor them. The tendency in late years is to have better pets, and this will further insure the demand for assistance. Many hunting dogs give their owners more real pleasure than they get in any other way. The majority of the pet animals become like a member of the family and is taken care of in the same way. Extension of small animal practice into new areas and an increase in this work where it is already established, offers the best prospect of increasing the demand for veterinary service and for veterinarians that the near future affords. All successful efforts to add to the information and to improve the skill of veterinarians in matters pertaining to small animal practice is, in a very real sense, building for the veterinary profession.

As an illustration of this small animal work in small communities, let me refer to a statement of a practitioner, residing in one of these communities, who recently wrote, "Tell your seniors to pay attention to the work in small animals. That is about all the money I can collect in these times of depression." Another, locating in a country town on account of its being in a good dairy district, had a cat for his first patient and a dog for his second.

To my mind, a dollar earned in small animal work, is a good dollar. It is a respectable dollar, and goes just as far as one earned in treating a case of colic or removing afterbirth. Much of the work comes to the office, and probably a greater percentage of it is profit. Furthermore, to me there is just as much romance in spraying a cat or a bitch, or treating them for disease as there is in doing obstetric work encountered in a large animal practice, and yet there are men who are not interested in this small animal work.

The younger men are quite well trained in this phase of the practice. The older men, who have not gone after this work, can become proficient if they try. To my way of thinking, the attitude of the practitioner toward his patients is as important as his knowledge. The two, of course, go together. One must have and show an interest in these animals, and a liking for them. If you do not like them, pretend to for a time, and you will find, after you become familiar with them, that they are much like the unknown neighbor who was found to be a pretty good fellow after you became acquainted with him. Take some time to make an examination, and when possible, handle your patients like babies. I believe it was Walt Whitman, who speaking of fishes, said, "Handle them as though you loved them." This is a good maxim for the small animal man. Take pains with your work; never do it in a slipshod manner.

We believe that these special numbers are good supplements to text books. The

writer of a paper is not cramped by custom. He can give his personal experience, and can go into details as much as he desires. He can assume that he is talking to graduates, and can treat his audience as such, bearing down on some important features, and omitting others of less importance. Many case reports can be used. A good case report goes a long way in describing a condition and gives exact information as to the handling of it. In text books, on the other hand, description must be more or less general instead of specific. This is not a criticism of text books. It just so happens that we expect the author of a book to bring together all that is known about a subject, and arrange it in a more or less uniform manner. The writer of a magazine article possesses an immense advantage in that the text book writers have already prepared the soil for him and it remains but to cultivate it; his is the glamorous part of the task.

In conclusion, I hope this number will be as helpful as the profession has testified that the previous ones were. It would have been impossible to produce it without cooperation. I have personally thanked every contributor, and now take pleasure in doing it publicly. Their cooperation has been deeply appreciated. Finally, I want to thank the publisher, Doctor Campbell, for the opportunity of bringing this material together, and no less for the patience he has shown in my tardy assembling of it.

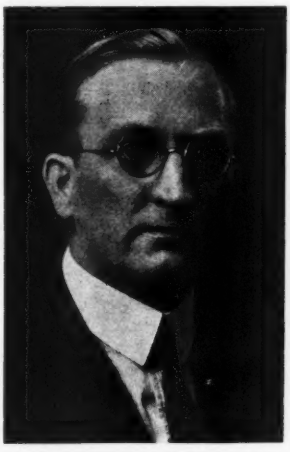
H. J. Milks

Doctor Milks will be surprised when he sees this addendum to his introduction. With more editorial experience he would have written his introduction to exactly fit the space available and thus forestalled additions.

The veterinary profession, and particularly that increasing portion of it engaged in the treatment of pet animals, is indebted to Doctor Milks for many contributions to its information and advancement, not the least of which is the three special issues of this magazine on small animal practice. Although the head of one of the busiest departments in the institution with which he is connected, he has elected this additional work, for the general improvement of practice among pet animals.

Doctor Milks began life by being born in New York State in 1879, for which he is entitled to no particular credit. From the State Normal School at Courtland, he went to the New York State Veterinary College at Cornell University, from which he was graduated in 1904. He served two years as Animal Pathologist of the Louisiana Experiment Station and returned to his Alma Mater in 1909 as Assistant Professor of Materia Medica and Therapeutics; was advanced to Professor of Materia Medica and Director of the Small Animal Clinic in 1914, which position he still holds. He is married, has three sons, is the author of several well-known veterinary text books and frequently appears on the programs of veterinary meetings, conferences and short courses in his own and other states.

Lack of space has forced the postponement till next month of the publication of a number of excellent articles prepared for this issue. Included among these are articles by Blamey, Bergman, Bower, Brown, Garbutt, Mann and Schlotthauer and two by Doctor Milks.—D. M. C.



HOWARD JAY MILKS
Head of Department of Materia Medica and Small Animal Clinic, New York State Veterinary College.

Some Common Diseases of the Eye

By C. H. COVAULT, Ames, Iowa
Department of Veterinary Medicine
Iowa State College

THE structures making up the ocular apparatus of the dog are frequently the seat of injury or disease. The successful treatment of these affections demands skill, ingenuity and the exercise of good judgment on the part of the veterinarian.

It is not the purpose of the writer to attempt in this discourse a systematic classification of these diseases or to discuss any one of them in detail. As the title suggests, I wish to call attention to those diseases most frequently encountered in our practice and in so doing will emphasize the conditions under which they occur, together with methods of treatment.

Conjunctivitis

Conjunctivitis occurs with considerable frequency and in a variety of forms. If we exclude those cases accompanying canine distemper the catarrhal form is most common. With us it is seen mostly during the summer months, either the result of irritation from dust (road dust, pollen of plants, etc.) or from the force of the wind. The latter operates in dogs that have the habit of riding on the fender or with the head out the window of the family car. These cases are usually called to our attention before they are far advanced. Usually there is mild congestion of the conjunctiva, but little, if any, swelling; early, there is lacrimation and slight photophobia; later, there is noted an accumulation of mucus at the inner canthi.

If put under treatment at this time healing is rapid. If the cause is removed and the conjunctival sac cleansed once or twice daily with some mild antiseptic such as 2% boric acid solution, recovery is well advanced in one week. If these cases are neglected or if the irritant is more intense in its action, severer symptoms are observed and a correspondingly longer time for healing is required. Specially designed goggles, that eliminate irritation from wind, have been used successfully by tourists whose dogs ride the fenders. Dogs that are forced to hunt or work through dusty vegetation should have the conjunctival sac carefully cleansed with some such solution as 2% boric acid once or twice daily in an effort to hold the irritation to the minimum.

Purulent conjunctivitis is seen both as a primary and as a secondary disease. It is a prominent symptom in distemper, probably the result of secondary infection. It is frequently seen as an enzootic in young puppies, oftentimes affecting an entire litter or even spreading to other litters in a kennel. We see a number of cases annually resulting from foreign bodies in the conjunctival sac or in the lacrimal duct. These foreign bodies are usually awns or fragments of beards from grasses.

The symptoms of purulent conjunctivitis are characteristic. Depending upon the cause one or both eyes may be affected. The mucosa is swollen and reddened; there is an abundance of whitish, glutinous exudate which dries at the palpebral margins often agglutinating the lids. The irritant discharge causes the animal to rub the lids against objects or to scratch them with the paws. As a result of injury from this rubbing of the lids or from an extension of the infection, the cornea may become involved either by wounds, ulcers or a diffuse keratitis, any one of which can result in loss of sight in the affected eye.

An important factor in the nursing of the distemper patient is, in the great majority of cases, the treatment of the eye symptoms. Because of the irritating character of the discharge it should be removed several times daily using some mild antiseptic. After all visible accumulations have been removed the conjunctival sac should be flushed with such

agents as 2% therapogen, 1% creolin, 0.5% silver nitrate or any one of the many colloidal silver compounds, the dilution depending upon the one chosen. After removing all exudate we instill a liberal amount of a 2% mercuric oxide ointment and distribute it so that the margins of the lids are well covered. If this ointment has no other value it interferes with the drying of the exudate at the palpebral margins and thus lessens the irritation and decreases the danger of injury to the cornea. When purulent conjunctivitis appears in the small puppy, isolation should be practiced if possible because of the tendency for the condition to spread. Treatment of the individual animal is the same as outlined above.

In unilateral involvement or if bilateral and symptoms of general infection are absent, we suspect foreign bodies as the causative factor. Especially is this true where the onset of a severe attack is sudden. Animals thus affected have a profuse discharge from the eye, exhibit much swelling and redness of the membrane and evidence of considerable pain. Rubbing the affected eye often increases the injury. Keratitis is a common complication. After removing the accumulated exudate we instill sufficient of a 2% solution of butyn or 4% cocaine to render the parts insensible and search for the causative factor. In nervous animals a narcotic dose of morphine should be given. The examination should include the conjunctival sac, deeper surface of the membrana nictitans and the puncta lacrimalia. We have removed awns from the lacrimal duct of a size greatly exceeding what we had previously considered possible of entry. When these bodies have penetrated the duct to a depth where they are no longer visible, the puncta of the lower lid will invariably be much enlarged and the foreign body can be located with a probe. We have succeeded in removing such objects through the use of a middle ear cannula. This is a small, blunt and flexible tube designed to accommodate the adapter of a hypodermic syringe. We attempt to pass this cannula into the duct alongside the foreign body until the end has advanced to a depth beyond its anterior extremity. We then attach a hypodermic syringe containing normal saline solution and inject this under considerable pressure. As the narrow anterior portion of the duct cannot accommodate the stream of solution there is a backflow which exerts sufficient pressure to force the foreign body out. Foreign bodies in the conjunctival sac can sometimes be flushed out or wiped out with pledgets of cotton. At other times a forceps is necessary. Those on the deep surface of the membrana nictitans should be removed with forceps.

Experience has taught us that thoroughness is desirable and that the presence of a foreign body in these structures is an invitation to continue the search. It is not unusual to find several awns or their fragments on the deep face of the membrana nictitans. The physiological action of this structure causes these objects to be moved across a portion of the cornea and in a short time symptoms of a keratitis are present. Satisfactory results in the treatment of such conditions necessitate early and complete elimination of the irritant. Unless too much damage has been done to the cornea recovery is rapid after the cause has been removed. Medicinal treatment in the after care is the same as mentioned previously for purulent conjunctivitis.

While there are several additional forms of conjunctivitis a discussion of them here would add little of practical value.

Displacement of the Gland of Harder

Displacement, ectopia or luxation of the Harderian gland is of frequent occurrence. In many instances the only visible deviation from the normal, except for a slight congestion, is displacement of the gland. In some the gland is found upon histological examination to have undergone hypertrophy. In others, clinical examination of the protruded gland shows it to be highly reddened and roughened, resembling granulation tissue. The latter two facts no doubt explain the indiscriminate use by some veterinarians of "Hypertrophy of the Gland of Harder" and by others "Haw Granuloma" to designate any and all displacements of the gland. We prefer to look upon

the condition as a displaced gland primarily, considering other pathological changes as being secondary. We have no theory to offer as to why this gland becomes displaced except that we find it to be rather loosely attached in some animals so that it can be experimentally displaced by pressure properly exerted against the membrana nictitans near its base. It is not unusual for the recently displaced gland to return to its normal position spontaneously. It is seldom, however, that it so remains. While it may occur in any type of dog we find it most frequent in the prominent eyed dogs. The Boston terrier is very popular with our patrons and furnishes us with most of these cases. In fact, the condition is so common in this breed that we are frequently asked to remove the glands from normal eyes in show prospects before they are put on the show circuit. Almost every request for the trimming of the ears of specimens of this breed carries with it a request for the removal of this gland whether or not displacement has taken place. The owners of these animals argue that they prefer the removal of the normal structure to the chance of its becoming displaced while on the circuit.

The symptoms of displacement are so characteristic that it could scarcely be confused with any other affection of the membrana nictitans. The displaced gland is seen as a rounded body ¼ to 5/16 of an inch in breadth and flattened from before backwards, protruding above the free margin of the membrana nictitans. In some instances a constriction will be noted across such a gland resulting from pressure by the margin of the membrana nictitans anteriorly and the eyeball posteriorly. Some times the protruding portion of the gland is highly reddened and where there is prolonged luxation this portion sometimes has a granular appearance. In cases of long standing there is a constant discharge from the eye either catarrhal or purulent in character. Recent involvement is accompanied by lacrimation.

Although the recently displaced gland can usually be replaced with difficulty it is rarely that we have had satisfactory results in treating even carefully selected cases by this method. We practice surgical removal of the gland being careful not to injure the anterior surface or free margin of the membrana nictitans.

While quiet animals can be operated under local anesthesia we practice narcotizing the patient with morphine or nembutal and then render the operative area insensible by the instillation of a 2% solution of butyn or cocaine. With the structures insensible the gland can be grasped with a forceps and pulled upward and outward where it can be snipped free of its attachments with a pair of curved, blunt scissors. We at one time depended upon the instillation of adrenalin solution to assist in controlling the post-operative hemorrhage but have practically discontinued this practice. Hemorrhage is not serious and invariably ceases permanently after a very brief time. With the patient narcotized a moist pack can be applied with pressure for a short time to control hemorrhage if found necessary. When hemorrhage has ceased we cleanse the parts of all clots. After treatment consists in daily irrigation of the conjunctival sac with a 2% boric acid solution for five or six days following the operation.

We find that some veterinarians remove the entire membrana nictitans for the purpose of correcting this condition. This is a mistake that should never be made. This membrane has a very important function to perform in protecting the delicate structures of the eye and should never be removed except when the seat of malignancy or where, because of extensive traumatic injury, its satisfactory repair is impossible.

Wounds of the Membrana Nictitans

Wounds of the nictitating membrane, while fairly frequent, are usually not serious. Unless they perforate the deeper membrane they should not be molested except to wash away any accumulating exudate daily. Where the free margin of the membrane has been cut through and shreds or flaps are floating before the eye, these should be clipped off. Needless to say, local

anesthesia is necessary for satisfactory examination and treatment.

Malposition of the Lids

Entropion, inversion of the lids, occurs from a variety of causes. We find it in pups suffering from nutritional disturbances. It occurs in dogs of all ages as a result of chronic inflammation of the lids or from cicatrization of wounds of the lids. It is also seen as a result of inherited predisposition, being very common in certain families and in certain breeds. We are called upon to correct this condition in the Chow more frequently than in all the other breeds combined. In these animals it probably results from the small size of the eyeball. The extent of damage to the eye is determined by the amount of inversion and the length of time the affected eye is neglected. The hair of the lid coming in contact with the sclera and cornea produce conjunctivitis, keratitis and sometimes ulceration. There is a copious discharge of tears and pus. An examination of the affected eye should readily disclose the offending lid.

In the pup suffering from deficiency disease the lids will usually take their normal position if the fundamental disease is corrected. A generous diet of lean beef, milk and green vegetables will usually supply the essential elements. Recovery will be assisted by the daily administration of cod liver oil and the lactate or gluconate of calcium. To insure against further injury to the eye in these cases we fix the offending lid in position during the period of recovery. We evert the lid and dry the surface as rapidly and thoroughly as possible. When dry we place it in normal position and coat the surface with flexible collodion. When the collodion has dried it is not possible for the lid to invert. Usually the collodion will remain in position for one to two weeks and oftentimes the one application is all that is necessary.

All other cases of entropion are treated by the usual surgical method. The patient is narcotized and after the area has been prepared for operation, we infiltrate the skin of the lid with 0.5% apothesine or procaine. An elliptical piece of skin is removed from the eyelid, parallel to the margin and about ⅛ to ¼ inch from it. The margins of the resulting wound are affixed with fine silk or a No. 0 catgut. The wound is then covered with flexible collodion. If sutured with catgut the wound will need no further attention. If silk is used the stitches should be removed in three to four days. Treatment of the eye complications depends upon their character and the behavior of the dog. In tractable animals we cleanse the parts daily with appropriate antiseptic solutions. In nervous Chows we seldom attempt any treatment of the eye lesions before we have healing of the operative wound except that we always instill a liberal amount of 2% yellow mercuric oxide ointment into the conjunctival sac at the close of the operation. Any attempt at enforced treatment of the eye lesions in the intractable animal may quickly undo all that has been gained by the operation. The one difficulty in this operation is in determining the proper amount of skin to be removed. The common error is failure to remove enough and this necessitates a second operation. It is seldom that the experienced operator finds a second operation necessary.

Ectropion, demanding surgical attention, is comparatively rare. It is observed in the St. Bernard and blood hounds as a result of inherited predisposition and in field dogs as a result of chronic conjunctivitis. In this condition the margin of the lower lid drops away from the cornea and leaves exposed a considerable amount of conjunctiva that soon becomes highly reddened. This together with the constant flow of tears gives the animal an unsightly appearance.

A number of operations have been used to correct this condition. The one which we prefer consists in the removal under aseptic conditions of an elliptical piece of skin just lateral to the external canthus. The long axis of the ellipse should be at right angles to the margin of the lower lid and its center on a direct line with it. The amount of skin removed depends upon the amount of correction necessary. The margins of the wound are affixed with No. 0

catgut and the sutured wound covered with flexible collodion. Another operation which we sometimes use consists in the removal under aseptic precautions of a V-shaped piece of skin from the center of the lower lid, the two branches of the V extending to within an eighth of an inch of its margin. When this wound is sutured the margin of the lid is forced upward and inward. The width of the branches of the V is determined by the amount of correction necessary. The wound is sutured with catgut and protected with flexible collodion. The type of dog in which this condition is found can in most instances be satisfactorily operated under local anesthesia.

Luxation of the Eyeball

While this can occur in any dog it is mostly seen in those with prominent eyes (Boston terriers, Pekingese, toy spaniel, etc.). Luxation may result from pressure exerted in an attempt to restrain the animal. Or it may result from a blow properly directed and this factor is usually responsible if the accident occurs when dogs are playing together. If the patient is seen immediately after luxation has taken place, reduction can be accomplished by exerting pressure against the protruding organ. A thin pad of wet gauze or cotton is placed over the eye to protect the delicate structures before pressure is applied. Swelling takes place rapidly in the luxated structures and reduction is apt to be difficult where the condition has existed for some time. It is invariably necessary to reduce the swelling through the use of warm antiseptic packs. Some apply adrenalin to the base of the mass. Reduction of the ball can further be facilitated if the lids which are inverted in this condition, can be alternately lifted with some blunt instrument as pressure is being applied to the eyeball. We find that small wound retractors work very well for this purpose. Many cases of luxation are presented for treatment only after irreparable damage has been done. The cornea, deprived of the moisture of the lacrimal fluid, dries rapidly and is soon beyond repair, rendering any attempt at reduction a contraindication. We have encountered a few cases that could not be reduced because of extensive hemorrhage and resultant clot in the orbital cavity. Obviously, where reduction is impossible or where the luxated eyeball is irreparably damaged, enucleation is indicated.

Keratitis

The function of the cornea is such that injury to or disease of the structure is a matter of great concern. Inflammation of the cornea is readily recognized because of the early pronounced change in appearance. Keratites are variously classified and the many forms can and should be recognized in practice. All forms have certain things in common and for sake of brevity this description will be limited to brief mention of fundamental symptoms.

The inflamed cornea shows local or diffuse turbidity, the affected portion being white, bluish white or gray. Photophobia and lacrimation, while varying in degree, are always present. The scleral vessels are injected and the conjunctiva reddened. If irritation to the part persists there is apt to be vascularization and the blood vessels can be seen as small, red, radiating lines traversing the opaque cornea. Ulceration is common, the ulcers varying in size and shape. Many are round with well defined sharp borders as though they had been punched out. Some are irregular and their edges not uniformly defined. The base of the ulcer may be flat, concave or convex and is sometimes roughened. Old ulcers often show vascularization.

The prognosis in keratitis is always guarded because of the possibility of complications or sequellae which may impair or destroy the sight. One should keep in mind the great variety of terminations possible. There may be rapid and complete recovery. The acute symptoms may subside rapidly leaving opacities that are slow to disappear. In some instances opacities are permanent causing partial or complete loss of sight. Anterior synechia is not infrequent. Perforating ulcers result in panophthalmitis and blindness.

Cases that appear favorable may suddenly develop complications resulting in an un-

satisfactory termination. Also, cases that show alarming symptoms sometimes make a slow but remarkable recovery.

The first step in the treatment should be directed toward the removal of the cause whenever this is possible. Foreign bodies should be early and carefully removed. Entropion, trichiasis and districhiasis should be given appropriate surgical attention. The use of irritant antiseptic solutions in the treatment of conjunctivitis may cause keratitis or if a keratitis exists it may be daily aggravated by the use of such solutions. One should be sure that any such treatment is discontinued. When it occurs as a symptom or complication, treatment of the primary disease is often of first importance.

We sometimes encounter a keratitis in animals that are debilitated following serious illness or in animals that have suffered from prolonged, improper feeding. Faceting of the cornea is common under such conditions and some of these facets undergo ulceration. The building up of the general health of the patient is of first importance and this should be done by furnishing a generous diet of nutritious food.

The patient with keratitis should be kept in darkened quarters. If pain is marked, relieve through the use of local anaesthetics, 2% butyn or cocaine, as needed.

To prevent anterior synechia the iris should be kept out of the way through the use of atropine. For some years we have made extensive use of a proprietary preparation, succus cineraria maritima compositus in 50% solution, in nearly all cases of non-suppurative keratitis and have used it in conjunction with antiseptic solutions in some suppurative cases. Its use is empirical with us but we have felt that our results justified its continued use. A few drops are placed in the affected eye once or twice daily. We have felt that the turbid cornea cleared more rapidly and that we have had fewer permanent opacities with this treatment. In the suppurative form we flush the cornea two or three times daily with warm antiseptic solutions such as 2% boric acid, 2% ichthyol, 2% therapogen or 1 to 10,000 biniodide of mercury.

Ulcers commonly require direct treatment. When shallow and the reparative process is slow, curettement or cauterization is indicated. We rely upon cauterization with liquid phenol. With the animal narcotized and the cornea rendered insensible with local anesthesia we touch the margins and base of the ulcer with the tip of a small blunt probe that has been dipped in liquid phenol. The success of this method of cauterization depends upon the use of a minimum of phenol. To insure against an excess of phenol insert only the tip end of the probe in the liquid. Remove probe and shake vigorously to remove all but the thinnest film of phenol before using. If applied in this manner neutralization is unnecessary. One can observe the action of the phenol since the parts turn white immediately contact is made. After treatment consists in the daily use of mild antiseptics. The protargol type of colloidal silver compound in 5% solution is commonly used.

When the ulcer is deep and perforation threatens, an antiseptic pack applied under a head bandage may be of service. The cornea and conjunctival sac should be carefully flushed with warm antiseptic solution followed by the instillation of a 4% cocaine solution. The pack should then be put in place, making sure that the lids are closed. Pressure applied in this manner may prevent rupture of Descemet's membrane until such time as granulation tissue can strengthen the weakened cornea. We realize the difficulty and even the impossibility of using this type of treatment on many of our short headed dogs.

We use with gratifying results sterile milk hypodermically in 3cc to 10cc. doses every 48 hours in cases showing faceting, ulcers or opacities. We are convinced the reaction to foreign proteins stimulates the reparative processes and thus hastens healing. Physicians use the commercial lactproteins in preference to sterile milk because of certain objectionable reactions that accompany the use of the latter. We have had no dermatites or other objectionable reactions in animals from the injection of sterile milk.

Rabies of Dogs

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A SHORT discussion of rabies as it affects dogs is prompted by the fact that dogs are the principal disseminators of this disease among animals and man and also in the hope that something may be said about the disease as it affects dogs, that may be of interest.

The disease is present to some extent in the United States at all times and constitutes not only a serious menace to human life, but to animals of great economic importance. It is, of course, true that many diseases common to both man and animals are responsible for greater loss of life, but few if any, are more greatly feared by the general public than is rabies.

Rabies is one of the oldest diseases known; certain facts concerning it such as the method of transmission, are said to have been recognized several hundred years before Christ.

Although some erroneous beliefs about rabies may still persist, especially as to the cause, it is now generally accepted as being a virus produced disease. It is transmitted by means of the saliva of affected animals. The saliva is usually introduced into the tissues of the body by the teeth in biting, but may gain entrance by coming in contact with wounds due to other causes.

Less than 50% of the persons and dogs bitten by known rabid dogs developed the disease. This may be explained by saying that some individuals may possess some degree of immunity; that the virus may not be present in the saliva of rabid dogs during the entire course of the disease and that the virus even though present may not be highly virulent.

It is also true that the teeth in passing through the hair or wool of animals or through the clothing, gloves or shoes of people, may be freed of the virus.

The more or less prevalent belief regarding the occurrence of rabies in the summer month only, has no foundation, except that dogs, which are natural disseminators of the disease, are given greater freedom during the warmer months, and may therefore cause a wider spread of the disease at this time.

The great prevalence of rabies in dogs may be explained by the freedom allowed them by their owners; by the fact that there are always a large number of stray dogs running at large; by the tendency dogs have of getting together in packs; by their natural temperament and because the use of their teeth is natural method of offense and defense.

One of the unusual facts about rabies is the great variation in the incubation period. It is probably safe to say that the usual period is from two to eight weeks. Occasionally it is considerably less than two weeks, and it has been known to be one year or longer. Pasteur in his early experiments accounted for this variation, at least in part, when he determined that street virus is not constant in its virulence. Another factor now known to have a bearing on the length of the period is the age of the person or animal bitten, it being shorter in children and in young animals. Still another factor is the location and extent of the bite. Face

bites or those nearest the central nervous system are the most serious. One accepted explanation for this, is that the face is very well supplied with nerves, which serve as the means of *rapidly* carrying the virus to the central nervous system. The distance between such points of inoculation and the brain, is of course much shorter than from wounds occurring on other parts of the body. Following such bites, the incubation period may be so short that symptoms may develop before prophylactic treatment, if attempted, is completed. Investigators have also shown that the period of incubation is subject to considerable variation in the various species of animals and that some individuals may possess some degree of natural immunity.

While, as already mentioned, there are usually some cases of rabies in the country at all times, there is plenty of evidence to show that the more serious outbreaks occur in cycles. For a number of years it has been observed that the height of these outbreaks occurs at intervals of about five years.

After having observed a considerable number of cases of rabies in dogs, veterinarians have become impressed with the great variation in the symptoms shown by different individuals. It is not intended to infer that the majority of cases do not appear more or less true to type, but simply to point out that there are many which do not present a typical picture and that it is the atypical or merely suspicious cases that warrant special study and careful handling. It may be impossible to arrive at a diagnosis during the first or second day of observation and the veterinarian or health officer should be respected for giving suspected cases careful consideration. The owner should be impressed with the advisability of having such observation made at places other than in the home.

Neglect or indifference may mean the exposure of both persons and animals. A happy solution to cases in which the owner wishes either to take a suspicious case home, or where when at home he refuses to keep the animal confined, is to ask the local Department of Health to place the animal under quarantine.

A very peculiar situation often arises in which, when an owner is informed that his dog may have rabies, he attempts to evade giving a true history of the case. He may deny knowledge of exposure of the animal in question and later admit such knowledge, or what may be more serious, he may say that no animals or persons have been bitten by it. Such individuals have been known to return in two or three days, after making the latter statement, and say that several persons, perhaps their own children, had been bitten. There have been instances in which, when the owner himself suspected rabies, he failed to keep the animal on leash when presenting it to the clinician for examination, or failed to warn him when conducting him to a stall, room or outbuilding where the animal to be examined was confined. An extensive educational campaign might prevent many such occurrences.

That the virus of rabies may be present in the saliva of a dog from five to nine days before the first symptoms are shown, is a recognized fact. For this reason it is deemed good advice, for those persons, both laymen and veterinarians, whose work may necessitate the handling of dogs, regardless of how nearly normal the dogs may seem to be, to avoid being bitten. By so doing, one not only avoids the discomfort occasioned by a bite, as well as the possibility of ordinary wound infection, but he also avoids possible exposure to rabies virus. We are quite firmly convinced that the veterinarian specializing in small animal practice should subject himself to the Pasteur treatment as often as may be necessary to keep himself permanently immunized.

We are all aware of the fact that the finding of certain bodies, known as Negri bodies, in the brain of a suspected animal, is considered as conclusive evidence that such an animal had rabies. *Failure* to find these bodies in the brain of an animal destroyed during the early stages of the disease, or in the brain of an animal that has shown typical symptoms, and that has died of the disease, is not of uncommon occurrence. Such

negative findings should not be taken as proof that the animal did not have rabies. The history of the clinical symptoms as given by an experienced veterinarian, should be given due consideration in deciding whether or not persons bitten by such an animal should receive the Pasteur or antirabic treatment.

Dogs that have been known to have bitten one or more individuals are often placed under the observation of a veterinarian for the purpose of determining whether or not they have rabies. The question is naturally asked as to how long this observation should continue. The answer which is generally conceded as being correct, is, that if the dog is living and well at the end of two weeks from the date that the biting occurred, it is certain that the animal did not have rabies at the time of the biting, and could not have had the virus of rabies in the saliva. Consequently it may be released at the end of the two weeks period. Veterinarians are also asked as to how long a dog which has been bitten by a *known rabid dog* should be confined and observed, or whether or not the Pasteur treatment should be administered.

The answer regarding the period of confinement is usually given as three months, but those concerned should be given to understand, that due to the variable incubation period, too great a feeling of security should not be felt even at the end of this period. The answer to the second half of the question, as to whether or not to administer the Pasteur treatment, is "Yes," but such treatment should not be started without first explaining to the owner, that, as in human practice, the treatment is not 100% effective. The owner should also be advised to keep the animal confined for several months and not allow it the usual freedom with members of the family. In fact, there is sufficient reason to believe that the treatment is not as effective when administered to dogs as it is when administered to man. This is explained by the fact that the dog is more susceptible to rabies virus than is man. Many veterinarians are of the opinion that the only really safe method of dealing with such a situation is the destruction of the animal bitten. All are well aware of the fact, that such advice may not be taken kindly by the owner, but it will at least relieve the veterinarian of anxiety, and may, if followed, be the means of saving human lives. Such conclusions have been reached after rabies has developed in dogs following long periods of confinement, as well as after the administration of a full course of antirabic treatment.

It is generally conceded that the virus of rabies is quite constantly localized in the central nervous system of animals affected with or that have died of the disease, however, it has been found in the salivary glands and in their secretions, in milk, blood and in the internal organs. The point of practical importance to be gained from such knowledge, is, that when conducting autopsies, especially upon dogs about which no definite history may be obtained, or when removing the head of a dog thought to have died of rabies, to afford the operator proper protection by the use of rubber gloves.

When submitting the brain of a suspected animal for laboratory diagnosis, it is important that it reach the laboratory in good condition. The head should be removed and packed in a small tin can or pail that can be tightly covered. This container should then be packed in a larger one, which may be filled with ice. If there is any doubt about the package not being delivered promptly, because of holidays or week ends, it should be delivered by a responsible person and as soon as possible, especially where there is a definite history of animals or persons having been bitten. Detailed information concerning the specimen should accompany it or be forwarded by special delivery letter, telephone or telegraph.

It often becomes one's duty to advise persons what to do after having been bitten by rabid animals. Such persons should be impressed with the possible seriousness of the situation and advised to consult a physician as soon as possible.

For our own protection in case of possible exposure and as a matter of general information, we should know that it is a good

thing to encourage bleeding of wounds in the hopes of mechanically removing the greater portion of the virus.

While it may seem inhumane to allow a dog, affected with rabies and under confinement, to die of the disease, a veterinarian should not be in sympathy with any other method of dealing with such a case. Experience has demonstrated that failure to find the Negri bodies, may sometimes be due to the destruction of the animal before sufficient time elapsed for their development to the stage when they may be seen readily by means of the microscope. It is further believed that an examination of the brain should always be made, if for nothing more than to complete the record of the case. In many instances County Commissioners have been known to refuse to pay for the treatment of persons bitten on a history of a clinical diagnosis only. Certainly the practice of destroying suspected animals by shooting them through the brain with a shot gun, thus mutilating or destroying the brain, is a poor practice, and veterinarians should help to educate the public against so doing.

So many cases having histories of "Bone in the throat," as given by the owner, have proved to be dumb rabies, that it is considered good advice to always be *suspicious* of such cases and to observe them a reasonable time before making an examination of the mouth or esophagus.

If all available literature on the subject of rabies was reviewed we would find mention made of possible cases or recovery, although authentic cases are exceedingly rare. The reason for calling attention to such a possibility, is that one may sometime have under observation an animal which shows all the characteristic symptoms, but which makes a complete recovery. Should we believe that recovery from rabies is not possible, it would be natural to conclude that an error had been made in the diagnosis and release an animal that *might* possibly be dangerous to have at large. Some years ago there was under observation in the Veterinary Hospital at the Ohio State University, a dog of the Spaniel type which showed all the clinical symptoms of dumb rabies. The entire clinical staff was agreed upon the diagnosis. When death did not follow, as expected, Dr. James M. Phillips of the Pasteur Institute of Columbus, was called in for consultation. He confirmed the clinical diagnosis, and believing it to be an atypical case and thought it advisable to make animal inoculations. Swabs were taken of the saliva in the mouth of this dog and inserted into wounds made in the napes of the necks of two rabbits. One rabbit died six days later with general paralysis, following convulsions. The other rabbit died twenty days after inoculation, having shown typical symptoms of rabies. Rabies virus was present in the brain of the first rabbit that died, even though the incubation period was short. This was used to inoculate other animals from which a sterile virus was obtained. The dog in question made an apparently complete recovery, was kept under observation for some time, and on the thirty-eighth day was destroyed. Still other cases are on record indicating that animals have had rabies and recovered. It seems that the big problem confronting us today is how to control and eventually eradicate this disease. It is said that in Australia rabies has never been reported, and in England and Norway there has not been a case for years. Prevention and control in these countries has been brought about largely by the strict inforcement of police measures.

All are aware of the fact that certain of our large cities, and few of our states have attempted compulsory vaccination of all dogs. At present the single injection method is being used. There seems to be some disagreement among investigators regarding the amount of dependence that may be expected from the use of the single injection method. However, experiments conducted by Schoening of the United States Department of Agriculture, and later by Broerman and Edgington of the Ohio Department of Agriculture and the Ohio Agricultural Experiment Station, indicate that while immunity was established by this method against virus from one or more sources, against a virus from another source, little, if any, immunity was afforded. Many owners of dogs who are really interested in the

welfare of these animals request that they be given the single injection treatment. This it is believed should be done. However, due to conflicting reports of its efficacy, the owner should not be allowed to believe that it affords absolute and permanent immunity. Time alone will serve to determine how efficient such preventive treatment may be. It is hoped that it may play a large part in the eradication of this disease. The control or eradication of rabies offers to the profession a real challenge and much good may be expected if the public can be educated to the point where demands will be made towards such an accomplishment.

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About Dogs

The average annual registrations in the Stud Book of the American Kennel Club for the decade ending December 31, 1933, was 51,000; for 1933 the registrations numbered 51,500. The greatest number, 59,500 was registered in 1926 and the smallest number, 46,800, in 1931. Boston terriers led with wire haired and Scotties second and third in number. More than 90 breeds are admitted to registry in the Stud Book.

There were 15 more dog shows of all types held in 1933 than 1932. Field trials reached a new high record last year. In 1926 the U. S. Department of Agriculture enumerated 7,000,000 farm dogs in the United States. The total number of dogs in the country is not known even approximately.

Flank Operation for Spaying Cats

Many veterinarians have trouble with healing when they spay cats through a mid-line incision. The reason for this is not easy to explain except upon more or less theoretical grounds. When an abdominal operative wound is absolutely sterile, and kept so, healing usually takes place promptly. The process of infection in cats always leads to necrosis with loss of tissue, and when this happens following a mid-line incision, there is always serious trouble. Sutures frequently cause stitch necrosis. In addition, the abdominal wall of cats is very thin and does not furnish much surface for adhesion. From contact with many practitioners, we know that the mid-line incision causes them trouble. To obviate this, some have devised an operation through a very small incision, and others use a sutureless operation. Not all, however, are sufficiently good surgeons or have enough of this work to make the latter two methods very serviceable. We know, too, of many operators who have little or no trouble with the mid-line operation.

WE HAVE been spaying cats through the flank for many years. In fact, this method was taught us by Dr. W. L. Williams. At one time, we employed the mid-line incision because it appeared possible to do a little cleaner operation in that way. At the time we abandoned it for the flank operation, we were getting too many cases of stitch necrosis, for satisfactory work. This may have been because we had not yet learned that the purpose of sutures was to hold in approximation rather than under much tension. This may be just the cause of the trouble of some operators and the unconscious knack or success of others.

In this description of the operation, good clean surgery is taken for granted. The instruments are the same as for spaying in any other method.

THE cat is placed on her right side upon the operating table, front legs together, stretched forward, rear legs together, stretched backward, rear parts elevated

slightly. Ether anesthesia is started. At the same time, the hair is clipped and shaved off an area in the flank, approximately an inch or inch and a half square. The place of incision is about midway between the angle of the ilium and the last rib, and low enough to avoid the muscles of the back, or in other words, about a half-inch anterior and below the angle of the ilium. It is a good plan to squeeze the urine out of the animal before disinfecting the area. The best time to do this is the first time, or any time, the animal struggles; at such a time it may be accomplished very easily, since we just have to continue a process which the animal has started. Scrub the area with some good antiseptic. We employ 1 to 1000 solution of bichloride of mercury in 70% alcohol, scrubbing for two minutes. After the scrubbing is complete, cover the area with a very thin layer of cotton saturated with the antiseptic solution.

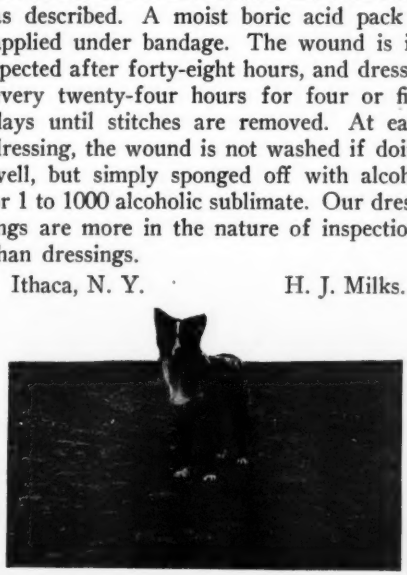
Operation

Remove the cotton pack, fold it down over the lower flank so as to protect the fingers, and grasp the fold of skin of the flank under it with the fingers of the left hand. Make the skin tight with left hand, and make an incision through the skin with scalpel in right hand. Incision should be from ¾ to 1½ inches long, depending upon experience of the operator. Release the skin, and make a puncture wound through the middle of the skin incision into the abdominal cavity. Lack of resistance will serve as a guide as to when the abdominal cavity has been reached. Introduce two hooks (aneurism needles do nicely) through the puncture or stab wound, and separate the tissues by pulling anteriorly with one hook, and posteriorly with the other. Then, using one hook as a dilator, search for the left cornu of the uterus. Introduce the hook fairly deep in the abdomen, turn the hook toward the back, hook up something, and bring to surface. In this position, if the cat is fairly empty, the horn is easily found. Then proceed as directed where the finger is used.

If using the finger, pass it through the incision, down to the aorta, then bring tip of finger to opening, and anything that is with it. The cornu or broad ligament are usually first encountered. If broad ligament, unfold this toward you, and the cornu will be brought into sight. Then trace this to the ovary, and proceed as in any spaying case. Tear through the broad ligament back toward the uterine bifurcation, grasp the other horn, and trace toward the right ovary. If the ovary cannot be exposed by very moderate pulling, either press the abdomen down with the left hand until the fingers can be placed beyond the ovary, or run the forefinger of the right hand along the cornu until the ovary is reached, pass beyond the ovary to the broad ligament, engage this between the finger and abdominal wall, and with a pulling motion of the finger, break the ligament sufficiently to allow the ovary to be drawn out through the wound. Finish removal of the ovary in the usual manner. The horns may be amputated near the bifurcation or replaced, according to the preference of the operator. We amputate them.

The left hind leg is then released and pushed forward to a natural position. This restores the skin to a normal position in which it is secured with two or three sutures. The peritoneum and muscles need not be sutured if the incision has been made as described. A moist boric acid pack is applied under bandage. The wound is inspected after forty-eight hours, and dressed every twenty-four hours for four or five days until stitches are removed. At each dressing, the wound is not washed if doing well, but simply sponged off with alcohol or 1 to 1000 alcoholic sublimate. Our dressings are more in the nature of inspections than dressings.

Ithaca, N. Y. H. J. Milks.



Canine Distemper and Its Biological Therapy

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CANINE distemper has been one of the most insidious diseases of animal life for more than a century. It appears to have been recognized as early as 1817, at which time it was rampant on Continental Europe. To Jenner is attributed the statement, in 1809, that it existed as early as 1759.

It was not until humanitarian impulses demanded the dog be relieved of its suffering that an exhaustive investigation of this disease was undertaken. For this purpose, the Distemper Council was created in England and Dr. P. P. Laidlaw and Major G. W. Dunkin, M. R. C. V. S., were selected to carry out the work, ample financial aid being given them by a fund popularly subscribed to by dog lovers in England and this country. They began work in the autumn of 1923 and published their results during the period 1926 to 1928.

Etiology and Transmission

It was proved conclusively that a filterable virus, first demonstrated by Carré in 1905, was the causative agent of canine distemper. This result has been confirmed repeatedly in this country. However, in an occasional instance the thought is still advanced that *Alcaligenes bronchisepticus* is not solely a secondary invader, but is as well an etiological agent. Hardenbergh[1] refuted this with abundant data, even before the advent of the Laidlaw-Dunkin publications and demonstrated that "bacterins and vaccines composed of *B. bronchisepticus* and closely allied organisms failed to protect against canine distemper."

With regard to the natural transmission of the virus, it is quite apparent that the principal factor is droplet infection. According to reliable information, the virus is also air-borne, but we have exposed ferrets repeatedly to air currents in a small infected room and as long as actual contact with virus-contaminated feed pans, litter, etc., was avoided, the susceptible animals failed to contract the disease.

There is evidence that the carrier problem does not exist. Experiments upon dogs that have recovered from distemper as well as upon those which have been successfully immunized with the live virus have failed in an attempt to demonstrate disease carriers.

Symptomatology and Diagnosis

As a result of recent investigations, we are forced to look upon canine distemper in a somewhat different light than heretofore. The malady may be divided into a preliminary, uncomplicated, or true-distemper stage; also, known as the filterable virus stage, which soon evolves itself into the period or stage of secondary invasion.

It is now recognized that the period of incubation is but four or five days, this being evidenced by a sharp rise in temperature, persisting for only 24 to 48 hours with a prompt return to the normal range. On about the ninth to eleventh day, the temperature again rises, this time somewhat higher. It is at this point that we first notice the characteristic muco-purulent conjunctivitis and rhinitis. From then on, secondary invading organisms take advantage of the debilitation brought about by the preliminary filterable virus infection.

It is quite difficult to state definitely that one is actually dealing with canine distemper; that is, if clinical manifestations are depended upon for a diagnosis. It is not uncommon for infected puppies to show nothing more than a slight and temporary malaise or lethargy, with perhaps some vomition. These symptoms may be associated with the initial rise in temperature,

[1] *Jour. A. V. M. A.*, Dec., 1925, p. 309.

disappearing with the return to normal range, and the cases fail to progress into the stage of secondary invasion. Pure, uncomplicated distemper may escape unnoticed, showing no symptoms but a rise in temperature and a 24 hours' inappetence. In other instances, one may be dealing with a streptococcic or bronchisepticus pneumonia as a lone pathological entity. Usually, however, such a condition is preceded by the preliminary filterable virus infection. Various intestinal infections and infestations may also simulate the complications of canine distemper.

Immunization

It is a conceded fact that in immunizing against a filterable virus disease one must resort to the use of living virus as an antigen if a *solid* and *long-lasting* immunity is the end in view. Dr. Hans Zinsser[2] of the Harvard University Medical School stated "active immunization cannot be achieved with killed virus. For the establishment of resistance it seems necessary that the cells react with the living virus." This is true both in human and veterinary medicine. Living virus is the essential factor in successful immunization against smallpox and yellow fever of man—hog cholera and fowl pox in the animal and bird realm. Rabies immunization is perhaps an exception, but even in this case we must repeat the vaccination annually. If living virus could be used, this would probably be unnecessary.

An explanation of how immunity is produced against canine distemper is as yet problematical. Evidence points to the fact that it is cellular in nature, not becoming humoral or general (antibodies in the blood serum) until hyperimmunization is resorted to. It is Dunkin's[3] tentative theory that the living virus persists in the tissues as long as immunity exists. If such is the case, the immunized animal is not a perpetual carrier of the virus.

All strains of distemper virus are identical in immunizing value and will cross-immunize, one against the other. This has been demonstrated in our laboratories, but was originally proved by Laidlaw and Dunkin who used some twenty different strains in their extensive experiments.

Laidlaw-Dunkin Prophylactic

It is obvious that live virus cannot be used upon a puppy without the institution of a preliminary protection. For this purpose, Laidlaw and Dunkin use a 20% suspension of spleen tissue taken from distemper-infected puppies. To the suspension is added sufficient formalin to inactivate its virus content. The addition of the chemical further serves to preserve the vaccine and in some way, as yet unexplained, it adds to its antigenic powers.

This formalinized vaccine is given to dogs subcutaneously in 5cc doses, serving to stimulate the production of sufficient basic immunity to permit the safe use of living virus 14 to 21 days later. This living virus is very delicate and repeated attempts to prepare it in suspension form, and have it retain its viability, have failed. It can be preserved, however, in fully potent condition by desiccation and distributing it in powder form. Just before its use, it is suspended in an appropriate diluent.

This virus injection is administered intradermally for two important reasons. First, when deposited between the two layers of the skin, it is absorbed very slowly and the existing vaccine immunity is able to hold it within bounds. If given subcutaneously, the virus is quite likely to be absorbed in an explosive manner with a resultant severe virus reaction, simulating actual infection. Secondly, the intradermal administration of the virus apparently has something to do with an ideal immunity production, at least facilitating its antigenic action.

Precautions

Some judgment must be exercised in selecting the proper cases for immunization if best results are to be obtained with the formalinized canine distemper vaccine and desiccated virus. The first or vaccine injection will precipitate untoward results if the

[2] *Bul. N. Y. Acad. Med.*, 1930, Vol. VI, No. 11, Series 2, pp. 709-733.

[3] *Lederle Vet. Bul.*, 1932, Vol. 1, No. 1, Apr.-May, pp. 2-3.

animal is heavily infested with intestinal parasites. If its history in this respect is not known, a fecal examination should be made and the vaccine injection deferred until such time as remedial measures have been effected. It is likewise placing the dog in a dangerous position if the vaccine is injected while the dog is in the incubation period of cannie distemper. Unless it is assured that the subject is free of infection, one of two steps should be taken. The animal can be observed for a period of 7 to 10 days awaiting the development of the disease, or an aborting dose of anti-canine distemper serum may be given. The dose of formalinized vaccine should not be given until at least 7 days after the administration of serum.

In a few exceptional cases, a rather pronounced reaction will develop four to five days after the second or virus injection. Observations made in such cases indicate that dogs showing such reactions are usually those of profound susceptibility to distemper, which may be due to a constitutional breed characteristic or the failure to develop some natural resistance to the disease in an environment which is comparatively free of distemper infection.

These reactions can be avoided by producing in such dogs a greater degree of basic or formalinized vaccine immunity. This is accomplished by administering two 5cc doses of the vaccine 10 to 14 days apart and following it up with live virus 14 to 21 days after the second injection of vaccine. In some instances it is also advisable to use such a procedure upon large dogs, such as the Great Dane, St. Bernard, etc.

There is abundant data to indicate that best results with the immunization procedure are obtained if puppies are vaccinated at a minimum age of three to four months. The puppies must have developed some maturity at the time the prophylactic is given and it is sufficient at this age. Postponement for another few months is unwarranted and only serves to endanger the dogs during a period of acute susceptibility to the infection.

Modifications

Vaccine alone has been used rather extensively in this country and to some extent in Great Britain. It will not confer an immunity of any lasting degree. Two doses of the product result in a protection of longer duration, but according to Dunkin[3] the immunity is not complete and it gradually wanes, ultimately disappearing altogether.

As indicated in a previous paragraph, anti-canine distemper serum can be given to abort incubating infection and if the subject is normal seven days later the vaccine-virus prophylactic may be started. If serum and vaccine are given simultaneously, the former counteracts the production of an active immunity on the part of the latter, and as a result one obtains nothing but a passive immunity derived from the serum which has become weakened to such an extent 14 to 21 days later when live virus is given that a virus reaction develops in the majority of cases. It is usually quite severe and additional large doses of serum are required to bring about recovery.

Errors in Administration

It is obvious that if an active immunity can be produced with safety and a high degree of efficiency by the side-to-side or simultaneous injection of anti-canine distemper serum and live virus, the procedure should be quite practicable. Unfortunately, the method has not proved sufficiently satisfactory to warrant its adoption. Its failure has been due, chiefly, to the inability to standardize the hyperimmune serum. A balanced dose of serum and virus must be given. In distemper, as in the classical hog cholera serum-virus method of active immunization, a too large dose of serum will totally inactivate the virus and induce merely a short term passive immunity. If too little serum is given simultaneously with the virus, infection results and it is necessary to use additional serum four or five days later to abort the virus reaction.

The necessity of adhering closely to the directions for administering the Laidlaw-Dunkin prophylactic cannot be emphasized

too strongly. Several cases similar to the one about to be described have come to the writer's attention. An unusually valuable group of hunting dogs was given serum simultaneously with formalinized vaccine. Fourteen days later living virus was administered, following which 13 of the 15 dogs developed distemper. The serum had "neutralized" the activity of the vaccine, thus preventing the production of a basic active immunity. When virus was given, if any immunity existed, it was but of a slight passive nature derived from the serum and entirely insufficient to ward off the infectivity of the virus.

The average small animal hospital, clinic, etc., is a source of natural infection and it is dangerous to hospitalize therein a dog that is susceptible to distemper unless some means of protection is afforded. In such cases anti-canine distemper serum should be used. Too often the mistake has been made of giving vaccine instead, in which cases immunity is not developed until approximately 10 days later. Furthermore, for a period of approximately five days after the vaccine injection, the dog is apparently more susceptible to contact infection than before it was administered.

In one instance the vaccine and virus were mixed and given subcutaneously as one dose. In numerous cases vaccine has been given in the early stages of distemper with subsequent unfavorable results. Sharp reactions have followed the administration of both vaccine and virus to glandular deficient patients and likewise to those suffering with rickets. Dogs have been taken on long and exhaustive hunts a few days after the virus injection and upon return to their kennels showed pronounced virus reactions. Such debilitating exercise should be avoided until at least seven to ten days after this injection.

Anti-Canine Distemper Serum

This serum should not be confused with the older product which was derived from the blood of horses hyperimmunized with the secondary invading organisms of canine distemper. The newer product is produced from the blood of dogs which have received repeated, large injections of the specific filterable virus of canine distemper and the secondary invading organisms. Being an homologous serum, it can be given in large doses without fear of anaphylaxis.

In addition to being efficacious for the treatment of distemper in both the early and late stages of the disease, anti-canine distemper serum can be used to produce a short term passive immunity. It is also of value in counteracting or aborting the development of distemper infection in its incubating period. It can be administered either subcutaneously or intravenously. Recent observations, however, indicate that best results are obtained when it is injected via the latter route.

Summary

1. The etiological agent of canine distemper is a filterable virus.

2. The principal factor in its transmission is droplet infection.

3. The disease has an incubation period of four or five days and is characterized by a preliminary, uncomplicated, or filterable virus stage, followed by the stage of secondary invasion.

4. Live virus must be used as an antigen if a complete and long-lasting immunity against canine distemper is to be obtained. This is a fundamental principle of the Laidlaw-Dunkin method of prophylaxis.

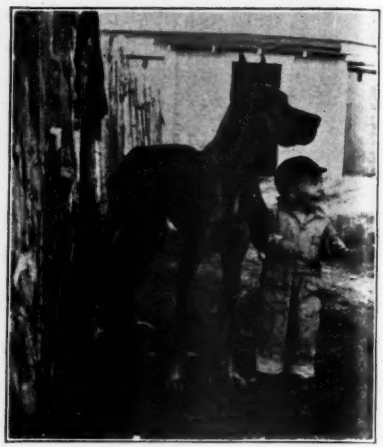
5. Cases for immunization should be carefully selected.

6. Several modifications of the Laidlaw-Dunkin procedure, such as, vaccine alone and serum and virus simultaneously are unsatisfactory.

7. Directions for administering the distemper biologics should be closely followed. The use of vaccine and serum simultaneously and vaccine for the production of an immediate protection have caused embarrassing results.

8. Because of its specific antibody content, anti-canine distemper serum is efficacious in the treatment of both the early and late stages of distemper. It can also be used to produce a passive immunity and to abort incubating infection.

Open Reduction and Mechanical Devices in Treating Fractures in Small Animals



By RICHARD A. SELF,
Dallas, Texas

AFTER I installed X-ray and fluroscopic equipment in my hospital I found out that the type of fracture work I was doing was, in reality, very poor. When I tried to set bones under the fluroscope I found that I was in many cases unable to reduce the fracture. When I applied casts over these fractured bones I found that, in the majority of cases, they did not supply sufficient and continuous traction necessary to keep the bones properly aligned.

I made a practice of taking an X-ray photograph of every dog that came in to my hospital with a fracture, and I proudly showed these plates to the owners. It was my desire and hope to also show them a picture when the cast was removed, but to my disappointment, in the majority of these cases, reduction was so poor that I was ashamed to show them to my clients. In the majority of these cases the animals walked on the limbs and the client was usually satisfied. Nature has been very kind to animals and through a change of angles of the bones the animal leg may lengthen to compensate for a shortened bone; false joints develop and with such changed angles and the ability of the bone and joint capsule to lengthen many animals walk almost normally in such cases.

I challenge any veterinarian who thinks his fracture work is good, to make a picture of the animal's leg after the cast is applied and see how many times he has failed to attain proper alignment of the broken bones with the type of cast customarily used, or make a picture when the cast is removed and see just what kind of an orthopedic surgeon he really is. I admit in most cases the dog will walk, but how—I often wonder. At any rate, I was not satisfied with this type of bone work as it was my desire to display my picture when the cast was removed just as proudly as before it was applied.

I HAVE a large investment in X-ray equipment, and it is my desire to sell X-ray service to my clients, but to sell it, it was necessary that I do such a type of work that I could afford to show them the plates. This desire to do better work, as well as to be able to sell my X-ray caused me to do some experimenting with various mechanical devices.

Many hours of painstaking work covering a thorough study of anatomy, dissection of nerves, muscles, blood vessels; experimenting with different devices; making several hundred X-ray plates and an expense of several hundred dollars in X-ray plates, tools, steel, and machine work, was necessary in this investigation. Many changes

Plate I. Straight Retractor. Shown in two sizes. May be used for all fractures of front and hind legs except fractures of the femur.

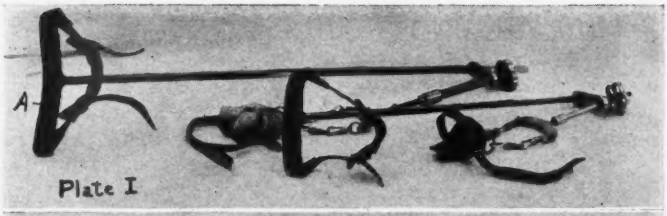


Plate IA. Straight Retractor in use. A, padded part; B, fixation strap; C, foot strap; D, lock pin; E, traction knob. The padded part is pushed well up against the body and fastened with a strap. The foot of the uninjured leg is also strapped so there will be no rotation when traction is applied.

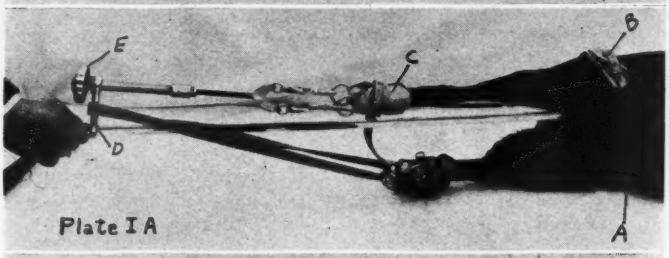
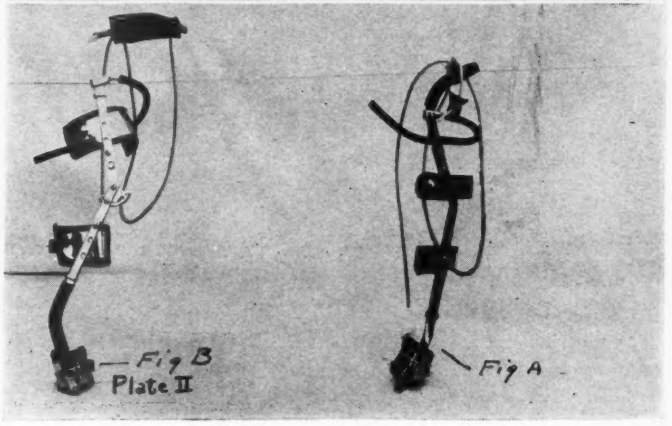


Plate II. Brace Casts. A, for front leg; B, for hind leg. They are adjustable for dogs of any size and in addition to fixing the leg in the desired position they exert continued traction and are especially desirable for transverse fractures. They possess many great advantages over a splint or a plaster cast. They are indestructible and seldom does a dog chew at them.



were made before I was satisfied with my equipment, but today I think my time and money was well spent. I have developed the mechanical devices explained herewith and used them for two years. I have found them quite satisfactory. I sincerely hope others will see their merits and through such devices improve their practices as I have improved mine.

General anesthesia, when possible, should be included before attempting reduction or traction with the use of any of these mechanical devices. It is important to attempt reduction of all fractures immediately when possible, while the muscles are still relaxed and before infiltration of tissue and nerve pressure occurs.

THE first device is the straight bar retractor, large size for large dogs, small size for small dogs (Plate 1). This is used for reducing all fractures of both front and hind leg, except for fractures of the femur, where a special femur retractor cast is used.

Powerful traction ordinarily used in pulling on bones is very dangerous and oftimes destroys nerves, ruptures blood vessels, etc. Remember, the ultimate goal; return to function depends on muscles and ligaments as well as bone. The bone may unite in good position after rough handling, but the damage in the soft tissue may be irreparable.

The primary aim of fraction is to counteract muscular spasm. This counteraction must be accomplished gradually and not by

straight hard pulls, and force. With the dog on his back, this straight retractor (shown in Plate 1 and in use in Plate IA) is designed to accomplish this. The padded part (A, Plate IA) is pushed well up against the animal's body and fastened in place with a strap (B, Plate IA) so that it cannot slip or turn. This is used on all fractures, except of the femur. The foot of the fractured limb is strapped with the lower leather strap (C, Plate IA). Then all slack is taken up by pulling the lock pin (D, Plate IA) back as far as possible. The foot on the other leg is likewise fastened with a leather strap and tightened behind the lock pin. The limb is now ready for additional traction and with the use of the fluroscope or feeling with the fingers, turn the traction knob (E, Plate IA) until the bones are properly aligned. The leg is now ready for the cast; reduction is complete.

THE type of cast depends upon the type of fracture. There are two types of fractures, transverse and oblique. In transverse fractures it is only necessary to apply a cast that will hold the leg straight and exert continual traction on the fractured part. The steel leg brace cast (Plate II) for front (Fig. A) and hind leg (Fig. B) can be used on these transverse fractures most successfully. They are adjustable to fit dogs of any size. The two ends may be switched to fit either a left or right leg.

These front and hind leg brace casts possess many and great advantages over the splint, or plaster casts. They are indestructible and it is seldom that a dog chews one off as he will a splint or plaster cast. They may be used over and over again indefinitely. In a year's time plaster, gauze, crenolin, adhesive tape, etc. cost enough to pay for something that will last a life time.

These casts are placed in position with flexible metal bands which are held in place by adhesive tape, or leather straps. This permits them to be kept tight so that they will not get loose as do plaster and splint casts. Also this permits of their periodical removal, to give the injured parts a chance to rest and for massaging. In addition when the leg is badly lacerated, or where a gunshot has caused the fracture, or where the end of the fractured bone has been pushed through the muscle and skin, this type of cast permits the treatment of such condition, and at the same time holds the fractured bone in position.

These front and hind leg braces are used on all transverse fractures, except fractures of the femur where the special femur retractor caste is used. Plates IIA and IIB show the front and hind leg brace held in place with adhesive tape. Plates IIC and IID show how the braces are held in place by fastening to opposite limb with the use of soft rubbing tubing.

The oblique fracture offers a more serious case. When traction is applied the fractured bone usually pulls into place easily, but when traction is released the contractile force of the muscles pulls it right back where it was before reduction was attempted. If union is allowed in this position there is an over-riding of the bone a resultant shortening; limping is a certainty, and in many cases a malunion occurs. Therefore the oblique caster (Plate III) is designed for fractures of this type.

WITH the drill brace (Plate VII) drill steel wires through the bone above and below the fractured ends of the bone, then fasten the oblique caster in place to these wires. This cast is lengthened or shortened by merely turning the nut (Fig. A, Plate III) and with such a cast most oblique fractures are handled quite successfully. Oftimes it is beneficial to apply the front, or hind leg brace from the under side of the leg over the oblique caster, so that the animal can use the leg while it is mending; the brace serving more or less as a crutch, as well as keeping the leg straight.

It is well known by all veterinarians that fractures of the femur are serious injuries, and the outcome of which is often unsatisfactory. The deep position of the bone under powerful muscles tends to pull the fragments out of line and it is difficult to correct and control this displacement by ornary traction and external manipulations.

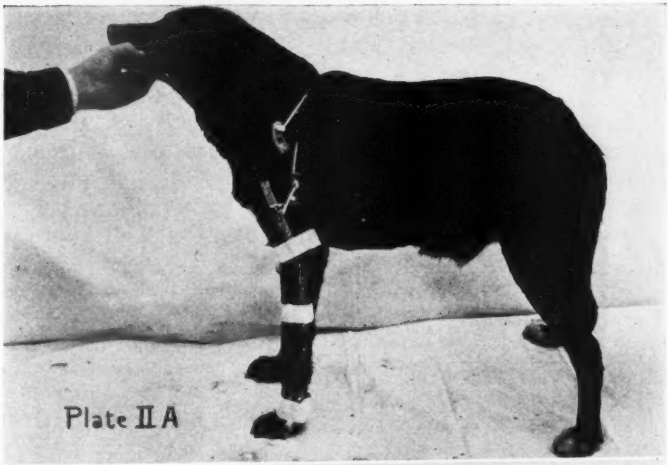


Plate IIA. Front leg Brace Cast in use, held in place by adhesive tape. This type of cast is successful even in fractured scapula.

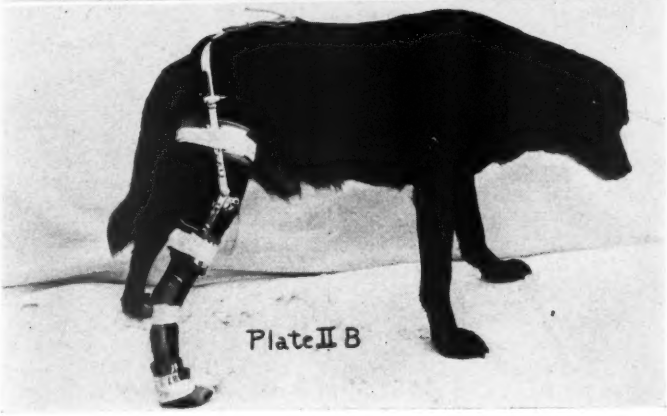


Plate IIB. Hind leg Brace Cast in use, held in place by adhesive tape.

I can hardly describe the use of this femoral retractor cast (Plate IV) without showing my personal feeling towards this instrument. I sincerely feel that in all fracture work, or in fact in any veterinary operation no veterinarian has ever developed an instrument that would give him any more personal satisfaction than this instrument has given me, and if I accomplish nothing else in the veterinary field, I believe this instrument will be a fitting contribution to the small animal practitioners of this country.

TO PROPERLY consider the treatment of femoral fractures a division is made of upper and lower fracture of femur.

In upper femoral fractures the muscle spasm of powerful gluteal muscles, semitendinosus and semimembranosus require that continuous traction be used.

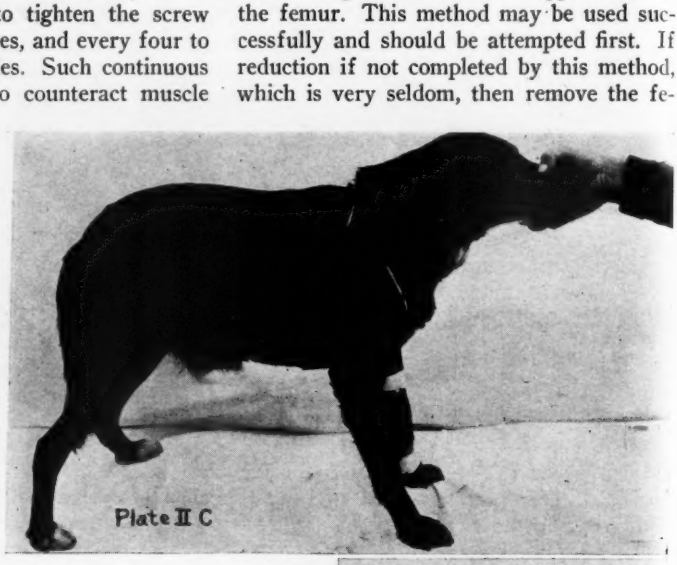
Well do I remember how hard I have labored to get these bones in alignment and then after finally succeeding and then casting, to find the next day, when examined with fluroscope that the muscles had drawn the fractured bone back again to where they were before. This recalls to my mind an article in one of the veterinary journals where the writer said, "And pull as you may, all the King's horses and all the King's men can't pull the ends of this fractured bone into place again."

With a drill brace, drill wires are drilled through the femur just above the condyles. (Plate IVA shows the wire after it has been drilled through the lower end of the bone.)

Then square pieces of ½ in. compressed felt, that have previously had small holes punched in the center, are slipped over each side of the drill wire to protect the leg from the lower arm of the retractor rubbing against it. Then the padded head (Fig. A) of the femoral retractor (Plate IV) is slipped over the foot and placed up well under the crotch, then the lower arm (Fig. B) is fastened in place to the drill wire. All that is necessary to reduce the fracture now is merely to tighten the tap (Fig. C) down on the spring (Fig. D) and as this spring gradually counter balances the muscle spasm it releases and pulls the bone down into alignment. Continue to tighten the screw every hour in early cases, and every four to six hours in old injuries. Such continuous traction is sufficient to counteract muscle spasms in early case in three to four hours, and in cases of two to four weeks' standing in three to five days. Plate IVB shows the dog standing with the casts in place and Plate IVC shows the cast in place from the underside of the leg.

Plate IIC. Attachment of the front leg Brace Cast to the body by means of soft rubber tubing.

Plate IID. Attachment of hind leg Brace Cast to body by means of soft rubber tubing.



WHEN the X-ray or fluroscope examination shows the bones to be aligned, or in the absence of X-ray or fluroscope facilities, when bones are reduced compare length to each joint and length of each limb with opposite limb, then the nut is screwed down tight and the entire device left in place for three weeks, or until union occurs.

In fractures of the lower third of the femur the fracture reduction is complicated chiefly by the gastroenemius and superficial digital flexor muscles. With such strong muscular spasm unless skeletal traction is employed these fractures often prove irreducible, and as in fractures of the upper third of the femur usually no amount of surface traction or limb manipulation will effect a proper alignment of the bone.

IN FRACTURES of the lower end of the femur reduction may be accomplished in two ways; in many cases where the fracture is not too close to the condyles, by following the same procedure as outlined above in reducing fractures of the upper third of the femur. This method may be used successfully and should be attempted first. If reduction if not completed by this method, which is very seldom, then remove the fe-

Plate III. Oblique Caster. A, adjustment nut for lengthening or shortening the Caster. The Oblique Caster may be used alone or in conjunction with the Brace Cast.

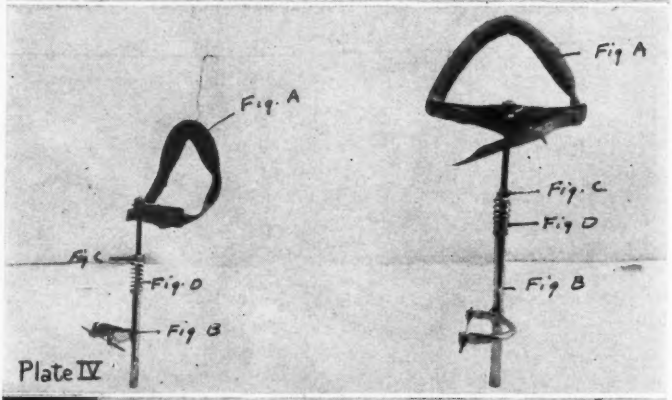


Plate IV. Femoral Retractor. A, padded head; B, lower arm; C, tightener nut; D, traction spring; the traction exerted by this spring is sufficient to overcome muscle spasm in three to four hours in early cases and within three to five days in the most stubborn of old standing cases of neglect.

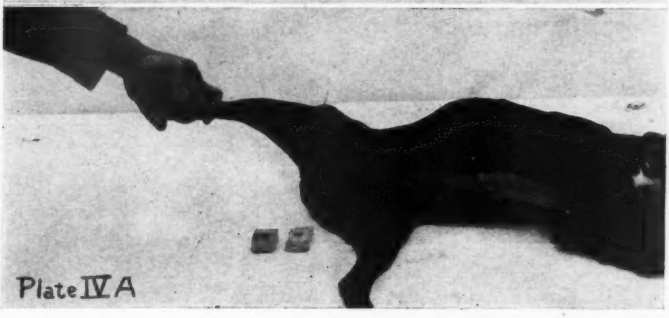


Plate IVA. The wire drilled in the lower end of the fractured bone.

moral cast, but do not remove the drill wire. Then fasten the wire tightener (Plate V, Fig. A) into this wire, and fasten the snaps of the bar retractor (Fig. B) into this wire on each side of the bone, instead of fastening the strap around the foot as in the case of reducing other type fractures. After the snaps are snapped in the wire, and lock pin is tightened, and all slack taken up, then turn the traction knob until alignment is achieved. Then a drill wire is drilled through the other end of the fractured bone, the oblique caster is fitted in place, and from the underside of the leg the hind leg brace is used to straighten and steady the leg.

In all cases where it is impossible to reduce the fracture of any bone by skin traction, and pulling on the foot with the bar retractor, the procedure as outlined above is used. Viz., insert the drill wire through the lower end of the fractured bone, fasten wire tightener into this wire, and fasten the snaps of the bar retractor into this and use this direct skeletal traction to reduce the fracture.

This femoral retractor cast is reversible so it can fit either a right or left leg by simply changing ends of the lower arm.

FOR fracture of the pelvis, dislocation of head of femur from acetabulum—and posterior paralysis, this adjustable go-cart (Plate VI) has been designed. Cases of pelvic injuries and posterior paralysis require no reduction, but with the straight bar

Plate IVB. Femur Retractor in use.

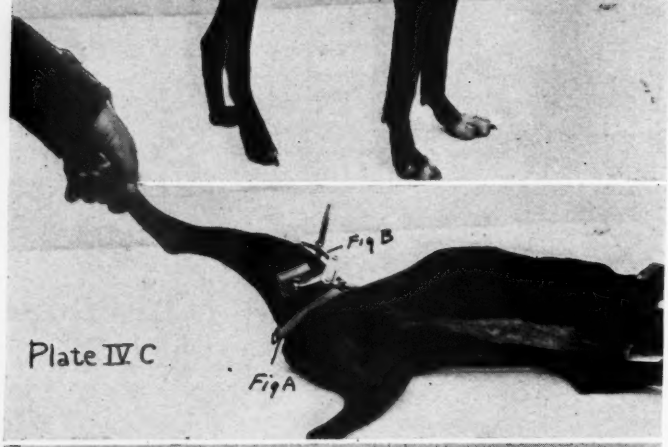


Plate IVC. Femur Retractor in situ.

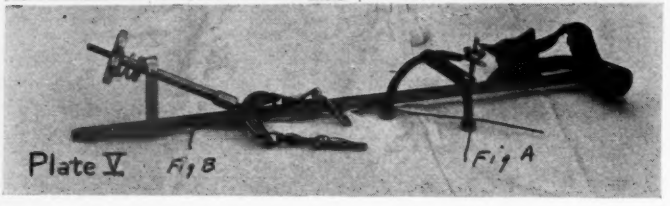


Plate V. Wire Tightener and straight Bar Retractor for fractures of the lower third of the femur. The wire is a bicycle spoke. It is drilled through the bone just below the fracture and hooked onto the snaps of the tightener. Then simply turn the screw till the fractured ends of the bone are in apposition.

retractor reposition of head of femur is easily accomplished; once accomplished the go-cart is fitted on and kept on day and night for two weeks. For posterior paralysis the go-cart is taken off nightly and the animal given exercise in it through the day until normal function of the paralyzed parts return. It is most necessary that the animal be fitted properly and as the cart is adjustable this can be accomplished easily. The cart must also be properly padded so that it will not rub or touch the animal. The most satisfactory padding for this go-cart, or in fact any of the mechanical devices mentioned in this paper, is ¼ in. soft felt. This felt can be purchased at almost any harness or saddle shop.

A TRAINED surgeon with the right conception of the problem will be able to reduce most fractures by manipulation or traction and direct the subsequent treatment for the patient's final recovery. It should therefore be the aim of the orthopedic surgeon to perfect the technic of closed reductions. This will result in the successful treatment of many fractures that would come to open operation under less skillful care.

However, even with the greatest of care and skill there are some fractures that can't be repaired without internal fixation.

With the background of good mechanical sense and familiarity with principles of

splinting and training in bone surgery, one may consider open operation in:

1. Recent fractures after failure to reduce by well planned closed methods.

2. In case of malunion where sufficient deformity is present to interfere with function.

3. Non-union.

I have read the veterinary journal's technique, etc., for open reduction and possibly there are several good methods for fixing them with equally as good results, but in my experience the average technique suggested in most cases, and described in human use has not proved satisfactory for dogs. For instance, in femoral fractures if a long incision is made tear through the strong hip muscles separated or torn apart; then with bone forceps the bone is grasped and the fixation appliance used, it has been my experience that the danger of bone infection is too great for any veterinarian, who does not have sufficient cases of this type, to become a specialist at this bone work.

My experience in these cases where the heavy muscles are cut through and then resutured after fixation, is that the dog either tears the sutures out in about three days, or due to swelling, etc., they cut out of their own accord, and a nasty opening results with the bone exposed. If one should be fortunate enough to get by without infection it takes a long time for this incision to heal.

WITH the mechanical devices I have described in this article it is very seldom that I am not able to reduce a fracture, and it is only occasionally I have to attempt an open operation. In my method for open reduction and fixation a very small incision is all that is required. Plate 7 shows a set of instruments which are appliable for use in such open operations.

First before attempting open reduction, traction is applied with the bar retractor and wire tightener and the fracture reduced as much as possible; then with the aid of the fluroscope the bone screws are guided into the bone in the following manner. A small incision, rarely more than ¼ in. long, is made through the skin and muscle down to one end of the fractured bone. Then with a heavy drill, wire is introduced through the incision down to the bone and with the fluroscope as a guide this wire is put through both ends of the fractured bone. Plate VII shows two bones in which the screws are placed at proper positions. After drilling through both ends of the fractured bone this wire is worked back out of the bone, a bone screw is fitted into the drill brace and this screw is drilled into the hole made by the drill wire. When the screw has gone through both ends of the fractured bone, the drill brace is removed and then the small nut

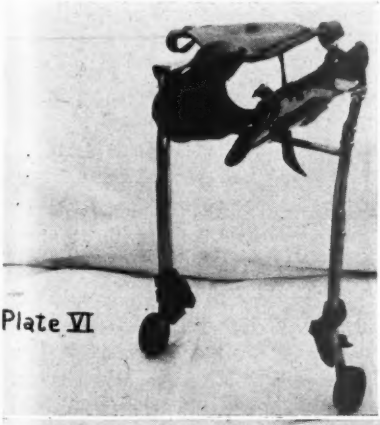


Plate VI. Adjustable Go-Cart for fractured pelvis, dislocation of the head of the femur and posterior paralysis cases.

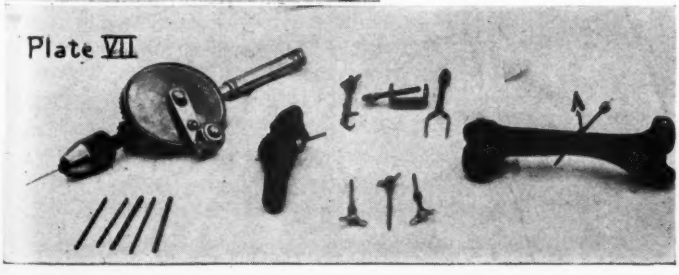


Plate VII. Bone Screws, Fork, Drill Brace and other appliances for open treatment of fractures.

shown on the bone screw (Fig. A) is worked down tight against the bone to hold the bone screw in place. The brace cast is then applied over the leg and the screw left in place for two or three weeks. With a pair of nippers the bone screw is cut off close against the animal's body so that in laying down, etc., the animal will not hit the head of the screw and loosen, or tear it out of the bone.

These screws are just like a wood screw. They screw right in the bone, and when it is time to be removed they may be screwed right out, just as any wood screw. No incision or anesthesia is necessary to remove the screws.

In all fractures it is excellent treatment to see that the animal receives calcium, parathyroid and small doses of cod liver oil as this hastens the formation of new bone tissue.

TO PRESENT this subject properly would take more space than I have been allotted. I hope at some future time to show some pictures of X-ray plates illustrating the results of these mechanical devices and to demonstrate more fully the advantages of these instruments.

I realize that many get excellent results in fracture work, particularly in young dogs, which seem to get well almost regardless of how the cast is applied, but the veterinary profession today is in a new era and the day is shortly coming when all high-class small animal hospitals will be equipped with X-ray units. I feel sure that after such equipment is installed and X-ray plates before and after reduction of fractures are routine that this article will be appreciated more than now.

Book Review

The Dog's Medical Dictionary: An Encyclopaedia of the Diseases, Their Diagnosis and Treatment, Poisons and Their Antidotes, and the Physical Development of the Dog. By Alfred J. Sewall, M.R.C.V.S., new edition revised by Frederick W. Cousens, M.R.C.V.S., Canine Surgeon by appointment to H. M. King George V. and H.R.H. the Prince of Wales. Cloth bound; price $2.75. 324 pages with illustrations. New York: Charles Scribner's Sons, 1933.

The publishers introduce this work as "a standard book complete with the very latest authoritative information." The subject matter, whether parts of the body, diseases, or medicines, are listed in alphabetical order. Sketches, in the application of bandages, are well done, illustrating types of bandages best fitted for the different parts of the body.

To the American small animal practitioner the use of chloroform as the agent for general anesthesia will be somewhat in conflict with his own experience. There are likewise a number of omissions which are quite striking by their absence. The reference to "worms" fails to include the existence of either hookworm or whipworm, with the maw worm classified as tapeworm.

Numerous therapeutic measures are given by citing the name of the manufacturer and the trade name of the product. Some of these commendations appear to be made without sufficient clinical evidence.

No detail is given of the Laidlaw-Dunkin prophylaxis, beyond mentioning experiments being conducted at the National Institute for Medical Research at Mill Hill, England, which in the author's opinion (March, 1932) had not been given "A sufficiently long trial to justify a definite judgment on their efficacy." American veterinarians confirmed years before this date the value of vaccine and virus in distemper control.

As a whole this edition has a definite appeal to laymen interested in dogs and possibly to some veterinary students.—H. J. Mostyn.

Observations From the Michigan State College Small Animal Clinic

We frequently derive more benefit from one properly administered enema in the dog, than can be obtained from the pill bottles of a well-stocked drug room.

INTERNAL parasites can be treated intelligently only by first making a fecal examination.

Routine fecal examinations have increased our small animal clinic business. The examination impresses the client. He tells his friends about it, which results increased demands for these examinations.

Fecal examinations generally show that two or more treatments several days apart are necessary to free the dog's intestinal tract from worms.

Many times errors of diet are discovered through the running of fecal examinations.

COCCIDIOSIS of dogs responds favorably to the use of colloidal iodine used in enemas, and also given per os.

A fecal examination is necessary to make a diagnosis of coccidiosis, and coccidiosis in the dog is fairly common.

FOR skin diseases, flowers of sulphur is the outstanding remedy for local application. Mix it with raw linseed oil to hold it in place.

For those who have use for ointments, we suggest the following:

Plain zinc oxide ointment.....30 parts
Camphor ..... 2 parts
Flowers of sulphur..... 2 parts
Mix.

SEVERAL years ago we started using nose drops along with the treatment of distemper. The following formula used three or four times a day helps keep the nasal tract open and breathing is much easier for the patient:

Penol
Tr. iodine, aa..... 4 drops
Mineral oil, qs..... 1 ounce
Mix.

Sig: Half dropperful in each nostril.

A USEFUL preparation for swabbing ulcers of the mouth cavity and other conditions affecting the mouth is made as follows:

Phenol ..... 1 part
Tr. aconite ..... 2 parts
Tr. iodine ..... 3 parts
Glycerine ..... 4 parts
Mix.

Sig: Use as swab twice a day.

The above formula deadens the pain where applied, and is very effective as a healing agent.

WE LIKE to use a pressure cooker for sterilizing all our towels, sponges, and instruments for canine surgery. We sterilize at fifteen pounds pressure for several minutes. This assures complete sterilization and the materials all come out of the pressure cooker in a dry condition, and in nice shape to use. It is necessary to heat only a small amount of water in these pressure cookers. Hence, there is a saving of time.

SILK worm gut is an ideal suturing material for external wounds.

WE USE tincture of iodine for disinfection of operative areas for both the dog and cat.

LAPAROTOMY wounds in cats heal better if the operative area is clipped rather than shaved.

WE PREFER the cesarean operation to the use of forceps and other traction instruments when live puppies or kittens are desired by the owner, in cases of dystocia.

We also prefer to operate through the median line instead of through the flank, on caesarean cases.

For laparotomy wounds, a single row of interrupted sutures is all that is necessary for closing them.

THE only way to keep a hospital free from foul odors is through the vigorous use of soap and warm water.

The surgeon who understands the use of soap and warm water seldom has difficulties of getting healing of the wounds he makes.

Edw. K. Sales.

East Lansing, Mich.

The Enema and Fecal Examination in the Dog

By E. J. FRICK, Manhattan, Kansas
Department of Surgery and Medicine, Division of Veterinary Medicine, Kansas State College

AN ENEMA, also called clyster or rectal injection is defined as a liquid to be introduced into the rectum.

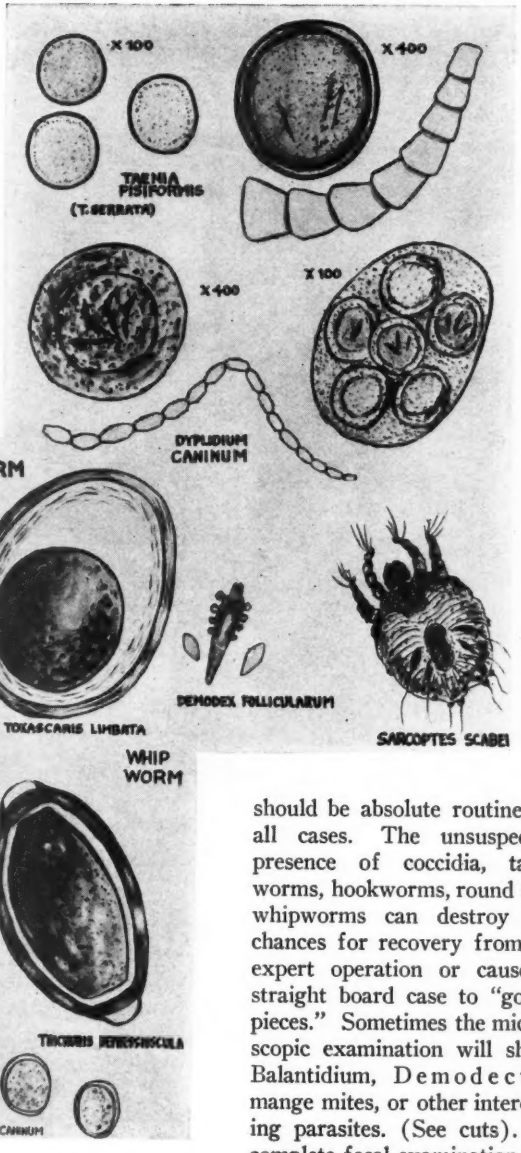
There are various kinds depending on the character of the fluid used. Among the most common are plain water, soap water, glycerin, mineral oil, sodium bicarbonate solutions, flavine and other antiseptic solutions. They may also be classed as hot, warm, and cold, also high or low (taken from the human whether inserted a long or short distance into the colon). There is also the food enema where milk and eggs, barley water, and soup may be used as a rectal injection.

The technic of giving an enema varies, but the usual procedure consists of having a glass irrigator on a stand with a six foot rubber drainage hose and clamp and a rounded nozzle for inserting into the rectum. The container is filled with the solution and the nozzle lubricated with oil. The dog is backed up to the floor drain with an attendant holding his head. With the left hand holding the base of the dog's tail the veterinarian then takes the fingers and thumb of his right hand palm down and carefully expresses any excess material in the anal gland; keeping the face out of line of possible forcible ejection following sudden removal of the plug obstructing the orifice of the pouch. The necessity for this operation is apparent when one realizes that anal glands full of pus, wax or putrid secretion are sensitive and tend to block the bowel movement. Swollen anal glands, besides being a source of irritation and even acute pain to the dog, are a primary cause of constipation and painful defecation.

When the operator is assured that the anal glands are reasonably empty, the nozzle is gently inserted with a rotating motion into the rectum just far enough to be beyond the anal sphincter and the fluid allowed to flow by gravity. In a short time the dog will throw out the fluid and any fecal contents lying just inside the anus. The nozzle can then be inserted a greater distance into the bowel and more fluid used and the process repeated until by external abdominal palpation the posterior portion of the intestines is ascertained to be as empty as desired. Usually when soft feces are returned the enema has accomplished its purpose.

The average dog brought to a veterinary hospital needs an enema for the following important reasons. First: Many of them are decidedly constipated as judged by the history of their frequent vomiting, difficult defecation and symptoms of mild toxemia. The fecal findings show hard, concretive bowel contents. An enema to such a case brings immediate definite relief and is superior to the purgative of doubtful action. In large cities the percentage of cases of constipation is less than in towns and rural sections. City dogs are generally subject to more controlled feeding. Second: Where the patient is not constipated the information gained by the veterinarian from the enema is exceedingly valuable; often times surprising information not obtainable in other ways is revealed. The feces from the enema should be examined for color. Is it black, red clay, white or other color? Is this color due to a drug administered. Bismuth subnitrate in large enough doses causes feces to appear coal black. Phenolphthalein makes them pink. Blood may be the reason for the red stool. Lack of bile is the common cause for a clay color. Large bone consumption tends to make the feces white. The consistency of fecal masses

should be noted. Are they sticky, pasty, thin, and liquid, or dry, granular and hard? The interpretation of the meaning of the consistency should check with the other findings. The odor should be given consideration. Is it putrid? Is the socalled "distemper feces" odor recognizable? Taeniasis can be recognized readily by its characteristic odor. Check the chemical reaction for acidity or alkalinity if advisable. Note if hair is present in the fecal deposit; or undigested peanuts, seeds, string or other foreign material. Are there tapeworm segments present? Note if there be a high gravel content. Valuable clues and much definite information will often times be apparent to the naked eye.



Microscopic examination of the feces should be absolute routine on all cases. The unsuspected presence of coccidia, tapeworms, hookworms, round and whipworms can destroy the chances for recovery from an expert operation or cause a straight board case to "go to pieces." Sometimes the microscopic examination will show Balantidium, Demodectic mange mites, or other interesting parasites. (See cuts). A complete fecal examination affords much valuable information to him who will exert the effort to obtain it. It requires but little time and apparatus to make and helps to eliminate a whole lot of guesswork, making diagnosis more accurate and therapeutic measures more intelligent and more effective.

Multiple Chondromata in a Dog

By H. W. SAWYER
Auburn, Ala.

A MALE hound, five years old and weighing about thirty-five pounds, was presented at the Small Animal Clinic of the School of Veterinary Medicine, Alabama Polytechnic Institute, for observation, diagnosis, and possible treatment.

History—The dog had been "farmed out" for several months, and the owner had not been in close contact with him for some time. Something over a month previously the owner had seen the dog, and had discovered his condition. At that time he appeared to be lame in the left hind leg, was vomiting quite regularly, and was quite thin in flesh. A visit was made to a veterinarian, who diagnosed the lameness as "hip lameness," and applied a counterirritant blister to the hip. Apparently nothing was done at that time about the vomiting. The dog remained at the veterinarian's hospital for about two weeks. The owner kept the dog at home for about the next two weeks, and fed him a pound and a half of beef daily, in an attempt to build up his flesh. However, the lameness failed to show any improvement, and the vomiting appeared to grow progressively worse. The dog "carried" the leg constantly, and invariably vomited immediately after eating.

Symptoms.—When the dog was presented at the college clinic the body was in a condition of emaciation, and the thigh muscles of the left hind leg were atrophied. Examination of the leg revealed no fracture, and no soreness nor tenderness at any point. An enlargement at the hip joint was noted, which in some respects resembled an anterior coxo-femoral luxation, but still could not be diagnosed as such. When the dog was fed he evidenced a ravenous appetite, and immediately gulped about half of his meal, which consisted of approximately a pound of raw ground beef, and then stopped eating. He appeared mildly distressed for perhaps half a minute, whereupon a portion of the food swallowed was returned to the mouth, chewed slightly, and re-swallowed. After a few moments this action was repeated, and after regurgitating small amounts into the mouth and re-swallowing them in this manner four or five times the entire ingested mass was finally vomited onto the floor. This mass appeared exactly as before it was eaten, except that it was moistened with saliva; it carried no odor. Almost immediately the dog ate the mass again, but more slowly, and this time appeared to have little difficulty in retaining it. After a few minutes the remainder of the meal was handled in a similar manner. Routine observations and examinations, as for temperature, pulse, respirations, intestinal parasitism, filariasis, etc., revealed all normal or negative.

Necropsy.—A tentative diagnosis of esophageal stricture, with a bad prognosis, was made, and the owner so notified. Instructions were received to destroy the dog, and this was done, employing ether euthanasia. Necropsy revealed multiple chondromata scattered throughout the body, and involving practically every thoracic and abdominal viscus with the exception of the spleen. The lower portion of the esophagus near the cardia was involved in a great mass of cartilaginous neoplasm, made up of hundreds, or perhaps thousands, of small spherical elements, varying in size from that of a birdshot to that of a small cranberry, with some flat pieces resembling whittlings from a lead pencil, and the whole mass bound together by an amorphous substance of the same character intermingled with the esophageal connective tissue. The lumen of the esophagus was practically closed for about two inches at this point, and devoid of its lining mucous membrane. The walls of the involved portion were approximately an inch in thickness, and firmly adherent to the surrounding structures. The stomach was

ORGANS OF DOG WITH MULTIPLE CHONDROMATA

1. Left femur, lateral surface of proximal extremity, incised to show cartilaginous new-growth;
2. Heart, showing two small chondromata;
3. Omentum, showing diffuse character of the tumors;
4. Mass of chondroma attached to sublumbar peritoneum;
5. Kidney, showing two large chondromata;
6. Lung, showing several chondromata of various sizes;
7. Liver, showing three chondromata;
8. Diaphragm, showing both large and small tumors;
9. Esophagus, with sizeable tumor formation, torn open to show part of constricted lumen;
10. Stomach, somewhat dilated, with several medium-sized chondromata on surface;
11. Duodenum, with its mesentery, showing one large chondroma on bowel and many small ones on mesentery.

The arrow points to the articular surface of the left femur. The entire proximal extremity was involved in cartilaginous new-growth.

somewhat dilated, although empty. It was liberally sprinkled with the chondromata, shot-size and larger, as was the intestinal serosa to a somewhat lesser extent. The liver had a considerable number of the same type formations, except that they were generally larger and somewhat flat on the surface. Those found on the kidneys resembled those of the liver. The entire lung surface, and the parietal pleura, were profusely spotted with the neoplasms of small to medium size, and many larger ones were found deeper in the lung substance. The heart had three or four such small tumors on the epicardium. The diaphragm, both on its thoracic and abdominal faces, and particularly over the muscular portion, was liberally dotted with the tumors. The peritoneum was sprinkled with them here and there, and firmly attached to the peritoneum in the sublumbar region was a sizeable tumorous mass of cartilage, composed of very small nodules bound together by an amorphous mass of the same character. The left coxo-femoral articulation was normal as to the articular surfaces themselves, but a mass of cartilaginous new-growth of about the size of a hen's egg was found, encasing completely the three trochanters of the femur and extending to the neck of the bone. This also was composed largely of small, shot-like elements held together by an amorphous mass of the cartilaginous new-growth.

A Treatment for Gastro-Enteritis With Toxemia

By L. H. LaFOND
Detroit, Michigan

We have had, as have all small animal practitioners, numerous cases in which we were obliged to make the diagnosis: gastro-enteritis with toxemia. These cases do not all present the same clinical picture; nor have always the same etiology. The history usually is faulty; the owner does not know what the dog may have eaten, and the patient cannot tell. Therefore we are compelled to place them all in one category, and call the disorder gastro-enteritis, adding any other complications observed, as jaundice, etc.

Occasionally the owner later ascertains what the animal ate that made him sick. This news is interesting, and may be helpful; but is usually too late to be of any real value in making the diagnosis, and determining the treatment.

I know only too well that some veterinarians will criticize the above statements. Some will say that we should be more specific in our diagnosis; that we should be able to differentiate quickly between a simple gastro-enteritis caused by faulty feeding and that due to metallic poisoning for example or as seen in typhus or other conditions. We, personally, are unable to do this at first hand.

We believe that laboratory examinations of the stomach and intestinal content, and of the urine may be valuable, but at the same time if treatment is postponed until reports of these examinations are received, usually there will be no need for treatment —the patient will be dead. Treatment must be started as early as possible, and if laboratory examinations are indicated, they can be taken care of later.

When a dog is presented to us, showing highly injected mucous membranes of the mouth and eyes, with no elasticity to the skin of the neck, a temperature either subnormal or at the most, slightly above normal, and a general sick appearance, together with a history of anorexia, excessive thirst, persistent vomiting, and perhaps a fetid diarrhea (this may or may not be present in the early stages); we, without any hesitancy, make a diagnosis of gastro-enteritis with toxemia. The term, autointoxication, is also used by some veterinarians.

The history may show that the animal has been away from home for some time; that he appeared all right when he first returned; that he ate his dinner eagerly, but vomited shortly afterwards; that about this time, or slightly later, the dog developed an unusual thirst, and that after drinking water or other liquid, would vomit immediately.

When the above situation arises, the wise owner will take his pet to a veterinarian at once. What usually happens though is: The dog is given a dose of castor oil, syrup of buckthorn, or whatever "the good neighbor" suggests. He is lucky if not severely wormed. It is usually hours before the veterinarian sees the animal which in the meantime has become very sick.

Our treatment is to hospitalize the animal at once. Water is not allowed except in small quantities (a tablespoonful or even less every half hour). I believe that ice is a good thing, if placed in a screened bottomed dish, in such a way that the dog may lick the ice, but can obtain no ice water from the melting of the ice. We give bismuth subcarbonate in mineral oil, using about one to four; that is, one ounce of the bismuth (weight) to four fluid ounces of the oil. We prefer light mineral oil because the heavy when thickened with the bismuth will hardly pour. We administer, depending upon the size of the dog, and upon the severity of the vomiting, from a dram to an ounce of this mixture every hour; if vomiting is severe, we give a smaller dose every half hour. Along with the above treatment,

we administer saline enemas frequently, even up to as many as six in twenty-four hours, depending upon the severity of the case. We feel, too, that complete rest is important, and that food should be withheld in the early stages.

Doctor Theobald, Cincinnati, uses large doses of a 5% saline with calcium gluconate solution subcutaneously, for these cases. I believe this to be a very good procedure; still better if used in conjunction with the oil and bismuth mixture and restricted allowance of water. Any complications, such as jaundice, etc., are treated symptomatically.

After vomiting subsides, and the patient is passing oil per rectum copiously, we usually change our medication to equal parts of bismuth, milk of magnesia, and elixir of lactated pepsin. This is given in about the same sized doses as the oil mixture, but less frequently. We also offer a little freshly ground beef, or sweet milk at this time. We have found churned buttermilk, or, better still, lactic acid buttermilk quite often enjoyed by the patient and apparently helpful.

When the animal is returned to the owner, we dispense a digestive tonic to be given about three times daily in order, mostly, to keep the owner from giving something else likely to be harmful. He feels better satisfied, and, too, if a relapse should occur, the question of treatment not having been carried far enough is not so liable to be entertained as the causative factor in the setback.

In the foregoing discussion no account is taken of vomiting and diarrhea secondary to attacks of nephritis; although accompanied by toxemia such cases are not primarily gastro-enterites.

Detroit, Mich. L. H. La Fond.

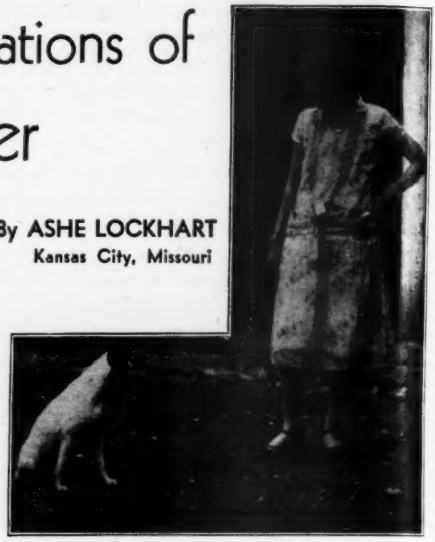
Comment. Treatment of vomiting: Vomiting may be defined as an upward emptying of the stomach or reverse peristalsis. It is a reflex act involving the center, afferent and efferent nerves, and the peripheral sense organs. It may be divided into regurgitation in which the intestinal content is returned to the stomach, and actual emesis where stomach content is thrown out of the mouth. In either case there is a reverse peristalsis. It is quite generally believed that considerable chyme is regurgitated into the stomach, and this ordinarily causes little trouble, and may be of benefit in preventing excess acidity of the gastric juice. However, if the stomach is more than ordinarily sensitive, vomition is the result.

SINCE vomiting is a reflex act and is essentially a reverse peristalsis, two lines of treatment are in order: First, to control the vomiting, and second, to establish an analward peristalsis. To control the nausea and vomiting, we can depress any of the structures mentioned above, but it has been customary to work almost entirely upon the stomach, either by coating the mucous membrane with a protective powder like the various bismuth salts or by using different anesthetics—phenol, cocaine, anesthesein, etc., and when we thought the dog would stand it, to give a laxative. Little has been recommended in the way of central depressants.

Keeton and Nelson, working on the hypothesis that vomiting could be controlled by central depressants, found that the bromides, chloral, paraldehyde, and soluble barbital, all worked well. They believe that sodium bromide is the ideal because it has less disagreeable side actions, such as depressions, etc., than barbital sodium. To stimulate peristalsis they used disodium phosphate. Clinically working upon man, they found that a powder containing one gram each of triple bromides, disodium phosphate, and sodium bicarbonate in 100cc of water worked exceedingly well. The experimental part of their paper is valuable because they bring to mind a central way of controlling emesis which has been used only occasionally. A few practitioners have used chloretone, and an occasional one, morphine. I have observed a few cases in strychnine poisoning in which apomorphine failed to cause emesis when administered after a central sedative like chloroform or morphine. These observations tend to confirm the theory that central depressants are valuable in gastritis or other causes of vomiting.—H. J. M.

"Nervous" Complications of Canine Distemper

By ASHE LOCKHART
Kansas City, Missouri



SINCE Carré's announcement in 1905 that canine distemper is a filterable virus disease, numerous investigators have studied both true canine distemper and its many complications. It is now quite generally recognized that true canine distemper is an acute, febrile septicemia caused by the filterable virus of Carré, and most investigators are agreed that many of the symptoms which were formerly considered as being characteristic of distemper are manifestations of secondary infections.

Of the various complications of canine distemper, perhaps the most important is that which is characterized by so-called "nervous" symptoms. At certain times this condition develops in a very large percentage of dogs affected with canine distemper and is responsible for an exceedingly high mortality rate. It is not deemed necessary to describe this complication to any veterinarian engaged in small animal practice, but in order to avoid confusion we shall consider only that type of nervous derangement which develops during or immediately following an attack of true distemper.

There are, of course, many things which may produce spasms in dogs and which are sometimes difficult to differentiate from the nervous complications occurring in distemper. Parasitism, chemical action of certain drugs, disturbed metabolism, foreign bodies in the stomach or intestine, and perhaps other factors occasionally complicate diagnosis, but as a general rule the type of nervous manifestations occurring as a complication of distemper is very characteristic and should not be confused with spasms originating from other causes.

In exposing to distemper many thousands of healthy young dogs obtained from rural districts and known to be free from disease, we have never observed the development of so-called distemper spasms until at least twenty-one days had elapsed after definite exposure to distemper. This observation clearly points to the fact that nervous manifestations should be classed as a complication rather than as true distemper.

In dogs which have died as a result of this complication and in those destroyed during its advanced stages, the pathologic changes are fairly uniform and characteristic. The meninges of the brain are usually congested, somewhat thickened, and rather cloudy in appearance. The brain proper shows little microscopic change. The ventricles of the brain contain an abnormally large amount of fluid, which is usually somewhat opaque and contains many small flocculi. The heart frequently contains endocardial hemorrhages and sometimes epicardial hemorrhages are found. The spleen is usually enlarged and presents some subserous hemorrhages.

Rosenow described a condition resulting from experimental inoculation which is identical with the condition under discussion. To quote from Rosenow: "The microscopic picture, although highly characteristic, varies considerably, depending on the duration and severity of the symptoms. In the animals that dies relatively soon of especially severe symptoms, meningeal infiltra-

tion by polymorphonuclear leukocytes and round cells, with similar but less marked localized parenchymatous and perivascular infiltration, dominates the picture. Polymorphonuclear leukocytes may be as numerous as round cells, especially in the meninges. Localized hemorrhages in the pia and substance of the brain, especially in the basal ganglions, are common. In animals that live for a longer time, the proportion of mononuclear cells in the meninges and perivascular spaces is greater, and meningitis is less pronounced and is limited to the perivascular spaces."

In our experience we usually find on microscopic examination some degeneration of nerve cells, particularly of the motor type nerve cells, with the occurrence of bodies which might be confused with Negri bodies. These pseudo-Negri bodies may be differentiated from true Negri bodies by their indistinctness of outline and their freedom from nuclear-staining granules. Stained preparations of fluid from the lateral ventricles and from impressions made from the pia mater quite constantly reveal the presence of peculiar bacterial organisms. In so far as we are aware, the first reference to this organism was contained in the report of the writer made in 1926 before the American Veterinary Medical Association, when the organism was described as belonging to the classes of diplococci or streptococci.

We have been able to recover this organism from the blood stream of affected animals in a large majority of those animals studied, and it has been recovered from the brain and lateral ventricles of almost all animals studied. When injected into suitable animals under proper conditions it is capable of producing typical symptoms and lesions of so-called distemper spasms. A complete description of the organisms which we believe to be responsible for nervous complications of canine distemper is to be found in the Journal of the American Veterinary Medical Association for May, 1932. It is our opinion that the organism is an atypical streptococcus capable of growing both in the blood stream and in the fluids of the brain and the spinal cord.

In June, 1929, we undertook the development of an immunizing agent to control this complication of canine distemper. A bacterin was prepared from the pleomorphic streptococci, and it has been used on more than four thousand dogs in our own establishment since that time. Prior to the use of this bacterin as an immunizing agent in dogs which were being used in the production of Homologous Anti-Canine Distemper Serum, the death rate from this complication in such dogs was approximately 15 per cent. Since using this as a routine procedure, the death loss from this cause has been slightly less than ½ of 1%. Beginning in 1930 a number of veterinarians in various parts of the United States co-operated with us in testing the efficiency of this bacterin in preventing the development of distemper spasms. Early in 1932 this bacterin was made available to the entire profession, and the results following its use are good, especially when it is used strictly as an immunizing agent. Hundreds of reports from practitioners indicate clearly that the use of this material has resulted in decreasing the frequency and severity of nervous complications in distemper.

It is recommended that bacterin prepared from *Streptococcus cerebritis canis* be used as a routine procedure in treating cases of distemper, beginning the treatment as soon as a diagnosis of distemper is made and before nervous complications are in evidence. Medicinal and biological treatment of nervous manifestations of distemper are not considered satisfactory. An attempt has been made to develop an immune serum for this purpose, but the attempt met with only partial success. In view of the fact that nerve cells, particularly motor nerve cells, are usually badly damaged by this infection, it is not reasonable to suppose that treatment will be successful in any appreciable percentage of cases encountered, but both laboratory and field results have shown clearly that immunization against this complication is a practical procedure which meets with success in a high percentage of the cases in which it is employed.

Further Studies on Commercial Dog Foods

J. W. PATTON,
East Lansing, Mich.

It is unnecessary to tell veterinarians who Doctor Patton is. However, his articles on commercial dog foods have been discussed so widely outside of the veterinary profession that some brief mention of his training and qualifications for nutritional investigation seems in order. He holds a B.S. degree from the Michigan State College; a D.V.M. from the School of Veterinary Medicine, Texas A. & M. College, and an M.S. from the Kansas State College. In addition he has taken special courses at the Michigan and Kansas Colleges and at the Massachusetts State College and Columbia University. His positions with educational institutions and in state work include: Agricultural Extension Service of Texas; Health of Animals Branch, Experiment Farms, Ottawa, Canada; Assistant Professor of Animal Husbandry, Massachusetts State College; Assistant Professor of Physiology and Pharmacology, Michigan State College. For six years he has been studying and investigating canine nutrition and during the past two years, he has devoted all his time to that line of investigation.—Editor.

IT IS almost one year since our last article on dog foods appeared in these columns. In the mean time we have had in our possession sufficient facts to have enabled us to write several articles on the morbid state of affairs of this business of commercial dog foods. We have elected, however, to await developments; then to bring the matter up to date. This is the objective of this article.

It is pertinent that we go back to our previous articles, and there pick up the thought that motivated this study and these articles. We have said that the dog and his owner are vital considerations in modern veterinary science, and further that the science of nutrition, as applied to the dog, is indeed backward and sadly in need of revision.

The Veterinarian Must Consider Adequacy in Dog Foods

The veterinary practitioner cannot, if he would, ignore matters nutritional in the conduct of his practice. For the past and present of his patients is a vital consideration in arriving at a diagnosis. In formulating a treatment, adequate diet is, in many instances, the only specific therapeutic agency required.

The veterinarian is constantly asked as to the relative merits of various brands of commercial dog foods; he uses prepared dog food in his practice, and the diet of their pets continues to be one of the foremost questions in the minds of his clients. He is forced to give nutrition daily consideration.

We have said before, that air, water and food are vital necessities of life. All three are important but the first two, air and water, are more adequately provided for by nature. In large measure only food is a matter of choice, and therefore, critical.

Man suffers when his nutritional appreciation fails to keep pace with his modern environment and mode of living. The dog who lives in such close contact with man also suffers in this respect and especially so because of the utter lack of nutritional appreciation and basic nutritional information in the case of the dog. Many of the problems of canine health and disease which confront and confuse us today would be less formidable and more readily understandable in the light of better nutritional information.

The Veterinarian Must Know Commercial Dog Foods

Veterinarians have every right to know what efforts commercial dog food manufacturers are making towards providing nourishment in their products. We have an obligation to find out this information for our-

selves if it is not forthcoming from the manufacturer. We are obligated to give our clients unbiased opinions on the relative merits of specific brands of dog food, or of dog foods in general when requested to do so, as we so frequently are. These studies, therefore, aim to give a cross section of the status of commercial dog foods as an aid to the practicing veterinarian in discharging a professional obligation to his patient and to his client.

Nutrition as Applied to the Dog

The writer has in preparation a second series of articles on this general subject. Unlike the present series, these will confine themselves to basic nutritional information to the end, that among veterinarians there may be a greater appreciation and understanding of nutrition in general and of nutrition of dogs in particular. We aim to make this second series entirely constructive. We feel that no apologies are necessary for the way the present series was treated. There should be no hesitancy to employ destructive criticism to a thing that needs destroying. In the writer's opinion, there was only one effective avenue of approach to the field of commercial dog foods. The weeds had outgrown and were choking the life out of worthwhile effort. No one disliked to travel this path more than the writer; but it was worthwhile, a better day is coming; in some respects, is here now.

Strife Where Cooperation Should Prevail

We have stated in previous articles that the average veterinarian and the majority of the manufacturers of dog food appear to have little interest in common. That to mention the word "Veterinarian" to a good many manufacturers of dog food, is a sure way to get a list of all of the failings to which we humans are heir. Conversely, for a client to mention to some veterinarians that he has fed commercial dog food is to provide an opportunity for these veterinarians to vent their spleen, and arrive at a quick diagnosis. In justice to the manufacturer of dog food there is some cause for their resentment. These veterinarians either condemn all commercial dog food without reservation, promulgate and foster superstitions or otherwise display ignorance of matters nutritional. The mistake is in supposing these men to be typical; they are the exception and becoming rarer.

Back Numbers Young and Old

There is a small minority of veterinarians who set themselves up as "Little tin Gods." Fortunately, their numbers are few; usually older practitioners who migrated from the ranks of general practitioners and whose claim to prescience is usually 25 or 30 years' experience. Firmly established now in small animal practice and long on practical experience and short on modern scientific training they assume a superior attitude and speak with assumed authority. These are the men who represent the greatest thorn in the side of the food manufacturer —men who have not learned that when forward motion ceases the law of gravity becomes operative. Unfortunately, many of them are highly vocal and make a noise out of all proportion to their importance.

Long experience is of relatively little significance in nutrition where the surface, so far as dogs are concerned, has barely been scratched. Nutritional research is so broad and our conception of its principles have been so revolutionized in recent years that the man who depends on what he learned 10 years ago is leaning on a broken reed. He is far behind the march of progress. It is not our intention to deprecate the value of experience, for it teaches lessons not readily learned otherwise. But the science of nutrition, as we understand it today and its application to dogs, is so relatively new that little of value even in the immediate past, will carry over and fit in our present day standard.

The "Eternal Triangle" Again

Let us think of the relationship between the dog and his owner, the veterinary profession and the manufacturer of commercial dog food as the three sides of a triangle. The dog and his owner form the base of the triangle. Without them, both the veterinarian and the food manufacturer would suffer in a business and financially.

The dog owner can dispense with both the others but only at considerable inconvenience and cost to himself. However, they

are not equally essential to him. He can and will more readily dispense with the food manufacturer than with the veterinarian. On the other hand, the veterinary profession can exist without the dog and his owner but the dog food industry cannot. The function of both the food manufacturer and the veterinarian is to serve the dog and his owner; they should have the same objective, the welfare of the dog and his owner. No one questions that this is the objective of the veterinarian. He has been long in this field and has had ample opportunity to learn that this objective pays.

But what of the objective of dog food manufacturers or rather of the majority of them, for as was mentioned in earlier articles and will be discussed again, there are exceptions among them? Too many show no wholesome interest whatsoever towards the base of the triangle. The dog that eats the food, the owner who buys it, are forgotten in the wild scramble to make sales. Too few give a damn about the dog. The package and the printing, the can and the label and the advertising has received the bulk of study. Interest in what goes into the package or can has served only to make it cheap.

The veterinarian has dogs of all ages, breeds and sex, and in various conditions and from different environment brought to him for treatment. The writer has an acquaintance in a large eastern city who often astonishes his clients by telling them what brands of dog food they have been feeding. Not so difficult for one in his position. Here is his formula: See a lot of dogs, especially young dogs. Know the brands that are offered for sale in the locality, then group the symptoms and the foods. At first you will have to ask questions—later you will be able to hit the group without questioning—and, if you work it out fine enough you can separate the different foods in each group.

Scientific Findings and Experience Agree

The writer has one food in mind, that he considers the most adequate food procurable in a can. He was, and still is, interested in finding out if this particular brand is as satisfactory in the opinion of veterinarians and dog owners as it appeared to be on biological test. In two years of such questioning he has heard only one complaint and that by a veterinarian who decries all commercial dog foods—one of the back-number, old timers referred to in the foregoing. Experience and the biological test agree on this food, as they will on others. We can go a step farther and say that the reason the dog owner changes from brand to brand is primarily a lack of adequacy, although he may never have thought of adequacy in biological terms.

An Asset or a Liability

Veterinarians have stressed adequacy and quality and manufacturers have replied that anything is good enough for a dog. We tried to tell them that the wise thing, the foresighted thing to do is to provide adequacy and quality—satisfy both the dog and his owner—and thus keep them steady customers; but have been told of perfect satisfaction with sales.

Some manufacturers of dog food have ignored the veterinarian. It doesn't look on the up and up. Who else, by training fits so well into the triangle? He has studied the inside and outside of a dog, as few outside his profession have. He knows the dog's anatomy both microscopic and macroscopic. His training in physiology, chemistry, bacteriology, pathology and other subjects in the field of general science would be an as-

set to most manufacturers of dog food, as would also his training in the more or less professional subjects such as food and meat inspection, feeds and feeding, sanitation and parasitology, to mention only a few. Then, of course, there is his training in pharmacy, pharmacology, therapeutics toxicology, surgery and specific diseases. He sees dogs in large numbers, knows dogs in a broad way, and works with dogs to a considerable extent. Truly there is no other training, professional or otherwise, that embodies such an array of subjects pertinent to the dog as does the four or five-year college course in veterinary medicine

But how few of the dog food manufacturers make use of the veterinarian's specialized training or endeavor to enlist his support. The dog food business is too mercenary, even for its own good. Too many manufacturers of dog food don't know dogs, don't own dogs and consequently can't have the owners' point of view. They don't appreciate the importance of adequate nutrition to the living organism, and would not care about it if they did. In other words, they spend all their eenrgy in making and exploiting dog foods. Their business is dollars, not dogs.

Delirious Promotion

Can anything be more ridiculous than the average radio program or more utterly fail to engender confidence in the foods they ad-

Exterior of Doctor Patton's Biological Laboratory, at Lansing, Michigan.

vertise. On one program we hear the manufacturer boast of using only horse meat and 15 minutes later, another boasts that his food contains only beef. If the hearer believes both statements, he will question both products. A third program gets the reader to thinking, a fourth gets him suspicious and the fifth convinces him all commercial foods are bad and makes of him a confirmed feeder of table scraps.

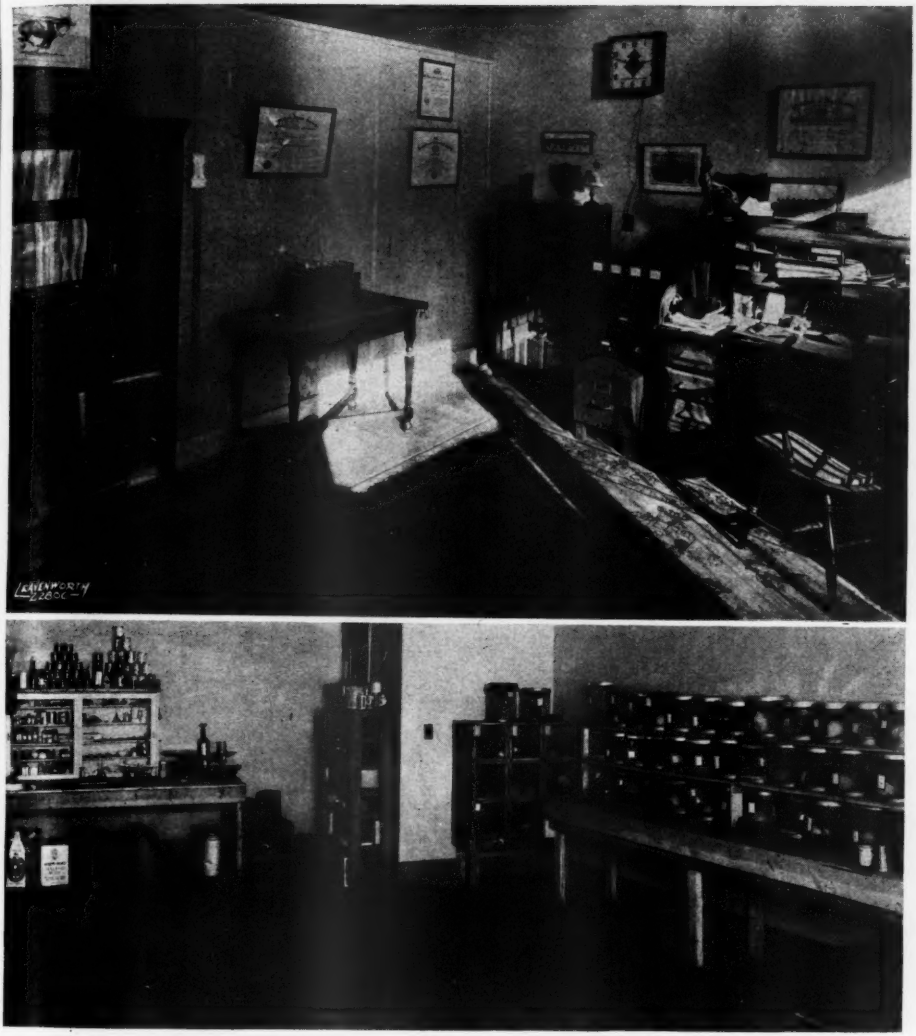
The Way to Enduring Success

The real interest of the veterinarian and of the dog food manufacturer is the same. Making the keeping of dogs easy, popular and pleasant is profitable to both. The veterinarian recognizes this and promotes the welfare of the dog and his owner in every possible way; perhaps he has learned this because he has been long in the field. Too many manufacturers have never given a thought to the food requirements of the dog or spent one single dollar to find out if their food is good for the dog. Their whole effort has been confined to the outside of the can or package—to devise a label and concoct a line of advertising that will sell the product, regardless of its effect on the dog; perhaps because they are new in the field.

Caveat Emptor

The silly No - Horse - Meat - Positively - Horse-Meat controversy occupies hours of expensive radio time and acres of label space. And what does it mean? Horse meat and beef may both be good dog food. So may fish and reindeer meat. It is not what it *was* but what it *is* that matters. Different parts of the carcass of any animal possess different biological (nutritional) values. Is it the ear of a cow or the loin of a horse? Is it the lung of a horse or the shoulder of a reindeer or the scales of a fish? Such are the questions that would be answered if the advertisers were thinking of dogs as well as dollars. ***It is what the food does contain, not what it doesn't contain that is important.***

"U. S. Inspected and Passed" too is employed to mislead the dog owner. This phrase means one thing on a dog food canned in an establishment in which Federal inspection is maintained, and canned under the same conditions that obtain for canned meat; but quite another on scrap and offal from inspected animals, canned in an establishment not under inspection, and labeled "Made from U. S. Inspected Meat." U. S. Inspected and Passed—passed for what? Edible or inedible? Food or fertilizer? No better certification of wholesomeness and quality is placed upon canned meat than "U. S. Inspected and Passed" but on a can of dog food, "Made from U. S. Inspected Meat" may ennoble (?) 50% lung and 50% weasands handled like coal. The Tugwell bill bringing animal food under official control is overdue. "Made from U. S. Inspected Meat" is openly used by unscrupulous manufacturers of the most unworthy foods on the market; not only to cover up their inferiority, but to imply superiority; a conscienceless deceit—and the dog suffers. So also do the manufacturers of superior foods suffer for under the circumstance, they can scarcely afford to omit the legend and abandon this apparent (though not actual) official certification. The dry foods are the greatest sinners in this respect. They may purchase scrap or even fertilizer from inspected establishments and use it without restriction, even mix with it meat from a desiccating works and still advertise that they are using U. S. inspected meat. Bones and trimmings from the meat market although they may go to a rendering plant and then be shipped to a manufacturer are still "U. S. inspected and passed" truly enough. They were formerly inspected and passed and at the time were clean and wholesome. Their later quality depends of course on how they have been handled; but the advertising is silent on this. The meat inspection act of 1906 covers only the legend "U. S. inspected and passed" and the official number of the establishment where the product was processed. This legend means exactly what it says. Other inspection claims mean much or little depending upon the user. There is no authority in the meat inspection law to control them. This is not made clear in the advertising. The tendency is for the uninformed dog owner to place them all, the goats as well as the sheep, in the same class



Corner of the Office and Section of "Rat Room" in Doctor Patton's Biological Laboratory.

and buy the cheapest until his pet fetches up in a veterinary hospital, and he learns the truth. *Caveat vendor.*

Reactions

As was to be expected, these studies on commercial dog foods were received with varying reactions. We were threatened with suits for libel on one hand and credited with revealing a "Jungle" on the other. We aimed to provide pertinent information for the veterinarian, but numerically speaking, our greatest response came from outside the profession. All told, more than a hundred thousand reprints were required to supply the demand. Requests for reprints came from individuals in all walks of life and from various business interests, both in this and in most foreign countries. These studies have been widely quoted and abstracted mostly in other than veterinary publications.

Some were pleased, others angered, few appeared indifferent. The writer has had more suggestions on what to write than he knows what to do with. To some we were too critical or destructive in our writings, others said we withheld destructive information, others wanted us to be more specific, or personal, in our remarks, others thought we were too much so.

The writer, and he alone, is responsible for this study and these articles. I have not been concerned as to pleasing or displeasing anyone. My sole aim has been to gather and present the pertinent facts about commercial dog foods that I consider the veterinarian as the professional adviser of several million dog owners is entitled to have. I only ask that final judgment be reserved until such time as all the facts have been told.

The writer has been requested many times to state the motive that led up to these studies. The reason is a personal one, but since it has been asked in good faith, here it is: The loss of a devoted and faithful companion—a dog; to whose lifeless body a promise was made and to whose memory these studies have been secretly dedicated.

It was the hope of the writer that because of these studies dog foods might be better; that canine nutritional matters would receive greater appreciation, and that scientific knowledge would soon replace ignorance and superstition.

We see this fruition gradually unfolding. Commercial dog foods are going to be better in the near future—canine nutritional matters are receiving greater appreciation and scientific investigation in canine nutrition is well under way.

Distributors Interested in Adequacy

What has happened in the two years since this series of articles was begun? Many things. For one thing, several brands of dog food are on the market for which the manufacturers can give scientific proof of their quality and adequacy. Their sales have mounted surprisingly. For another thing, the cleavage between the good and the poor foods is becoming sharper.

The appreciation of quality and adequacy on the part of buyers, large and small, has developed amazingly. I personally know of purchases of dog food aggregating during the past year almost a million dollars that were made upon the basis of quality and adequacy outlined in these articles. In addition a number of carload buyers who distribute under private brands, have submitted the products of several manufacturers for a biological test before letting their contracts. I have no means of knowing the aggregate of their distribution, but it is large.

My mail during the past year has contained many letters from large retail distributors of dog foods and without exception, all have shown an aroused interest in the quality and adequacy of the brands they are selling. "We believe that through our organization we can exert some influence toward raising the standard of commercial dog foods." "We are interested in knowing whether the products (dog foods) which we handle possess merit and represent good value *for the consumer.*" "We understand dog foods are largely a racket. We are handling the following brands (named). Please evaluate these as we have no desire to handle other than quality merchandise." The foregoing are typical of all.

Brokers too have shown a keen interest in quality and adequacy. One, who contemplated taking on a brand held up the contract until advised of its relative merits in these respects. Another who had lost several large accounts because the brand he handled was unsatisfactory, made inquiry as to the relative quality and adequacy of the brands under consideration and acted absolutely upon the information supplied, to mention only two of many who have written us all to the same purpose.

Discrimination of Utmost Importance

What of the future? Dog foods are going to be both better and worse in the near future. Those who control their source of raw material can make, and the prospects are will make, better foods. Those who do not control their raw materials will be forced to use poorer quality material or to pay a higher price for it, perhaps both.

NOTICE OF EXAMINATION FOR APPOINTMENT IN THE VETERINARY CORPS, REGULAR ARMY

Examination for the purpose of qualifying candidates for appointment in the Veterinary Corps, Regular Army, to fill existing vacancies, will be held April 16 to 21, 1934, inclusive.

Application blanks, Form No. 62, A. G. O., may be obtained from The Adjutant General or The Surgeon General, U. S. Army, Washington, D. C., or from the Commanding Officer or Surgeon of any military post or station, and when completed should be forwarded direct to The Adjutant General, U. S. Army, Washington, D. C.

The applicant must be a male citizen of the United States between the ages of 21 and 29 9/12 years, and a graduate of a recognized veterinary college.

ARMY VETERINARY SERVICE

The following-named officers of the Veterinary Corps are relieved from further assignment and duty at the Army Veterinary School, Army Medical Center, Washington, D. C., effective upon the completion of their present course of instruction, on or about February 5, 1934. Each will then proceed to the station specified after his name for duty.

Major Charles B. Dunphy, Fort Sheridan, Ill.

Major Herbert K. Moore, N. Y. Port of Embarkation, Brooklyn, N. Y.

2d Lt. Richard G. Yule, Fort Myer, Va.

Major Peter T. Carpenter is relieved from his present assignment and duty at Ft. Sheridan, Ill., effective at such time as will enable him to proceed to New York, N. Y., and sail on transport scheduled to leave that port on or about May 4, 1934, for the Philippine Department, for duty.

Colonel Robert J. Foster is relieved from duty at Fort Bliss, Texas, at such time as will enable him to proceed to San Francisco, Calif., and sail on transport scheduled to leave that port for New York on or about April 17, 1934; upon arrival in New York City will proceed to Washington, D. C., and report to the Surgeon General for duty.

Veterinary Reserve Corps

Promotions:

Kneup, Frederick, Geo., to Lt. Col., 4331 Pitts Ave., Cincinnati, Ohio.

Kucher, Paul Cox, to Major, Reckeweg Road, Fort Wayne, Ind.

New acceptances:

Meeks, Robert Benjamin, Major, 1806 Walker Ave., Kansas City, Kans.

Hannemann, Walter H., Capt., 1504 N. 24th St., Kansas City, Kans.

White, William Tisdale, Capt., 14 Edinboro Place, Newtonville, Mass.

Goldsmith, Charles A., 2d. Lt., R. F. D. No. 2, Chester, N. H.

Michael, Sidney Jerome, 2d Lt., 433 W. 9th St., Erie, Pa.

Pickett, Charles Deets, 2d Lt., 8043 Wornall Rd., Kansas City, Mo.

Rush, Loyal Luther, 2d Lt., Erie, Kans.

OHIO STATE VETERINARY CONFERENCE

The eighth annual conference of the College of Veterinary Medicine, The Ohio State University, will be held March 21, 22 and 23, 1934. This year, as formerly, the program is extensive and includes some of the foremost veterinarians and educators in this country. The entire three-day period will be devoted to the discussion of topics of vital importance to every veterinarian. A special effort has been made in arranging the program so that its quality and variety will appeal to all veterinarians.

The program this year has been formulated for the purpose of giving to the practitioner the very latest developments in veterinary medicine. A clinical program will be given on the third day which should prove to be an added attraction to all interested in the practical side of veterinary medicine. This part of the conference will be for the purpose of definitely illustrating a number of the important surgical and medical problems confronting the practitioner at the present time.

It is generally conceded that such intensive short courses provide necessary educational opportunities for the busy practitioner. Now is the time to arrange and be prepared for busier days ahead. Those in charge of the conference hope there will be a large number who will avail themselves of this opportunity to learn the very latest information concerning many of the real problems in their various fields of activity.

These short courses are sponsored by the College of Veterinary Medicine, believing it can render a real service to the live stock industry through the veterinary profession. Last year owing to financial difficulties it was necessary to temporarily suspend the conference but from now on an effort will be made to continue them annually. In the past years the attendance has been very gratifying to those who have been interested in promulgating these courses. The interest manifested in the programs and the various discussions entered into by those in attendance has been a source of much gratification also. An invitation is hereby extended to all veterinarians to be present on this occasion, to receive, we feel sure, much of value from an educational point of view.

Oscar V. Brumley

CALIFORNIA VETERINARY EXAMINING BOARD

The California State Board of Examiners in Veterinary Medicine effected reorganization at the meeting held in San Francisco on January 16, 17 and 18. Just prior to the meeting, J. F. McKenna of Los Angeles was appointed by Governor Rolph as a member to serve for a full term.

The following now constitute the Board: T. R. Creely, San Francisco, President; J. F. McKenna, Los Angeles, Vice President; G. E. Middlehoff, Oroville, Secretary; C. U. Duckworth, Sacramento, and L. G. Clark of Los Angeles.

Fourteen applicants were examined for license to practice in California.

32% INCREASE in biscuit sales!

This remarkable increase in the sale of Chappel's Ken-L-Biskit is but a tribute to *quality*. The "Fancier" appreciates the importance of *feeding* the dog—not just filling him up.

Ken-L-Biskit is made with fresh, raw, lean horse meat—which *science* has *pr ed *best* for the dog.

Combined with 19 other properly balanced ingredients, the *fresh* meat used in Chappel Biskits produces a biscuit food unequalled in genuine value. There are no other biscuits like Chappel's.

***Your customers* will appreciate Chappel's Ken-L-Biskits—the "Golden Cakes of Energy." Write us for any desired further information about them.**

* **"The nutritional value . . . of HORSE MEAT proved to be *Superior to All Other Meats*" in feeding dogs FROM EARLIEST PUPPYHOOD TO ADULT AGE.**
Dr. H. Loessl, University of Berlin, Animal Physiological Institute, Berlin, Germany

CHAPPEL BROS. INC., 503 Peoples Ave., Rockford, Illinois